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Communications intended for publication must be accompanied by the name and address of the writer, not necessarily for publication but only to satisfy the Editor.



THE COLLEGIAN

The All-India Journal of University
& Technical Education.

Why another journal?—this is the question which we are naturally prompted to ask whenever a new periodical comes into the field. There are already so many publications of the kind extant, that a new addition seems superfluous. But there are very few educational journals in India. The need for such journals was not so keenly felt some years back as it is now-a-days due to the recent educational activities of the Government as well as other educational advancements. The Government of India had to create a separate Education Department to cope with the growing demands for educational reforms. With this progress of education in India, the appearance of a new educational journal would not be altogether out of place; for it may be remembered that while in England there are nearly a hundred purely educational periodicals, here in India, we have got hardly a dozen, and out of these only one or two can claim to embrace wholly the educational movement throughout India. The present one is only a feeble attempt to remove this want. It furnishes its readers systematically with the educational news of India, especially of the Indian Universities and higher education in general; in other words, it may be termed a higher education gazette of India. For this reason, it has been considered necessary to publish it twice a month.

One of the main sections of the journal has been devoted to the Colleges. It embodies the

activities of the College-world in India, thus helping to establish an inter-collegiate relation between the various educational institutions. Another prominent feature is to keep its readers in touch with the educational progress of Europe and America. One of the chief aims of the journal would be to keep the friends of India abroad and other sympathisers in the cause of Indian Education, who are labouring under the difficulty of knowing the real state of things, alive to the educational needs of India.

The magazine is an organ of the student and the teaching communities of India and as such is to contain articles and contributions from eminent educationists and reputed professors and teachers. This together with the selections from the leading Indian and Foreign educational, literary and scientific periodicals, will provide in all a healthy, instructive and profitable reading alike for the teachers and the taught.

Specialised
Colleges

Every body would admit that the aim of the New Regulations of the Indian Universities is to secure efficiency, and specialisation is one of the main methods of doing so.

After the advent of the New Regulations it is being daily felt by the Colleges and those who are connected with them that the Arts and Science Departments of a College should for better work and good management be kept apart from each other. The Universities have from the Intermediate Examination—and in some cases from the Matriculation Examination—separated the Arts and the Science Courses. The Arts and the Science are two distinct departments now-a-days, each may hold its own separately without the help of the other. There are many "pure Arts" colleges perforce under the New Regulations, as for want of funds they cannot maintain the Science standard. The Universities, although recognising the Arts and the Science as separate departments, have not yet been able to totally discard all scientific subjects from the Arts course. But the colleges are for efficiency's sake already feeling the necessity for specialisation

and it is indeed gratifying to note that the Governor of Bombay has already allocated the place of the study of science as the proposed Science Institute at Bombay and has kept the Deccan and Elphinstone Colleges—the two premier colleges in the Bombay Presidency—specially reserved for Arts studies. The new Science Institute at Bombay would be certainly a magnificent institution and would be the premier specialised College in India. There is another College which teaches only the Science Course of the University up to the M. Sc. Standard—it is the Victoria College of Science at Nagpur, opened in 1906. In Calcutta, where there are already many colleges, it would be possible to make some of them specialised ones.

The colleges, at any rate, should not encourage such combinations of subjects as Sanskrit with Chemistry, or History with any other Science, or the like. It is the look-out of the Colleges, and it is the Colleges that would do this work of specialisation.

NOTES & NEWS.

We deeply regret to record the death of His Highness the Maharaja Sir Nripendra Narayan Bhup Bahadur, G.C.I.E., C.B. of Cooch Behar. His Highness was a patron of high education and his anxiety in the cause of education of his subjects, among other things, endeared him to his devoted people. He was also a pioneer in the sporting movement of India and was himself a keen sportsman and excelled in all manly games.

An educational exhibition is to be held at the City and Higher Elementary School, Kailty, commencing at 10 A.M. on the 28th September and lasting for three days. The Hon'ble Mr. J. H. Stone M. A., F. R. H. S. Director of Public Instruction has kindly consented to open the exhibition with Mr. S. P. Rice, the Collector of the Nilgiris in the chair.

Under the auspices of the Elementary Teachers' Association, Madura, an educational Exhibition

was held on the 9th September, when papers were read on Educational topics.

* * *

Haji Seth Karim Makoh of Peshawar City a leading Central Asian merchant has made a gift of half a lakh of rupees to the fund for the projected Islamia College the subscriptions to which now amount to over three lakhs.

In view of the regulation issued by the Madras University to institute a title in Oriental Learning (*Vidwan*), it is proposed to found a College in Madras where Tamil and Telugu will be taught as the 1st languages and Sanskrit as second language. At present the College will be situated in Mint Street.

We regret to report the death of Mr. Charles Golaknath, Principal University Law College, Punjab, which melancholy event took place on the 25th September, after an illness of four days. He was educated at Cambridge where he took his degree in Arts and Law. He was long connected with the Law College first as a professor and latterly as Principal. He was one of the trustees of several Dyal Singh Trusts and was universally respected for his attainments and sweet temperament. He was a brother-in-law of Sir Hirmam Singh.

* * *

The Nagri Pracharini Sabha of Benares invites best essays on the following subjects to be sent in by 31st December 1911. A *gold medal* for an essay on "Excessive Infantile Mortality in India, its causes and prevention." A *silver medal* for an essay on "The origin of the Nagri Script and its connection with the other chief Indian Scripts." A *silver medal* for an essay on "Wireless Telegraphy". A *prize of Rs. 50* for an essay on "The present system of education". They can be competed for by all persons without distinction of caste, creed or religion.

Hindi Essays
Prizes

The late
Maharaja of
Cooch Behar

Educational
Exhibition

ELEMENTARY EDUCATION.

SPKKECH BY DR. RASHBEHARI GHOSE.

WE met here to day to consider the Elementary Education Bill which was introduced by Mr. Gokhale in the Viceregal Council in March last. I am confident that I am not using the language of exaggeration when I say that Mr. Gokhale's Bill involves a question of the gravest national importance and I am glad to find that public opinion has spoken on it with no uncertain voice. At the present day elementary education is compulsory through the civilised world and shall we who boast of an ancient civilization, shall we alone lag behind? But some people seem to think that though we should educate the masses there ought to be no compulsion. Now persuasion is no doubt better than coercion but experience shows that without compulsion education can not be generally diffused among the people. Mr. Gokhale's Bill, however, as he himself said in his speech in Council, is a very modest and cautious measure and as you will presently hear from his own lips with that lucidity which always distinguishes his speeches an explanation of the leading features of the Bill. I will not detain you for more than a few minutes. I will only remind you that the Bill is of a permissive character and that under it the initiative must be taken by the peoples' representatives. Compulsion and persuasion thus, as the "Amrita Bazar Patrika" has said very happily become inter-changeable terms. It has been, however, said that the local bodies in this country are more or less under official control. But though this may be true of District Boards, it is not generally speaking true of Municipalities and I may add that before the District Board can be in a position to enforce compulsory education, there is every reason to believe that according to the recommendations of the decentralisation committee a majority of the seats will be filled by elected members. I must also remind you that the provision of the Bill will in the first instance apply only to boys and not to girls. Mr. Gokhale's Bill therefore, I repeat, is essentially a very modest

and cautious measure and the only provision, which is perhaps open to some controversy is the obligation of the local bodies to contribute a portion of the expenditure. Now I do not think that it would be reasonable to expect the central Government to find all the money, for the benefit primarily of the inhabitants of a particular place and as Mr. Gokhale has shown in his speech in every country where there is a compulsory system of education, the local bodies contribute a part of the expenditure. If therefore we are really sincere in our desire for the diffusion of primary education we must not object to the levy of a local rate for the purpose and I must warn you that if you insist upon the whole of the money being found by the Government you will have to wait till the Greek Kalends. The absence of anything said Lord Crewe only the other day like a complete system of primary education in India, is perhaps the greatest reproach which exists against the British system of Government in India. That reproach, I hope and trust, is now about to be wiped out but it can not be done without the cordial co-operation of the people which I may affirm not diffidently but confidently will not be wanting, as there are clear indications of a new and vigorous life in us which has only to be directed in the right channel to make a new India. True patriotism we have learnt demands sacrifices and should all be prepared to make them in a cause which must be dear to every one who loves his country. Dis-enchantment and disillusion are the portion of old age, but I have not lost faith in the generosity of my countrymen towards the toiling masses, nor in that divine gift of pity for their suffering fellow-men with which so many of them are inspired Gentlemen, I have said just now that public opinion supports Mr. Gokhale's Bill. But I see that in the immediate neighbourhood of Calcutta a note of dissent has been sounded. The Cossipore Municipality thinks it dreadful that a Brahmin boy should sit on the same bench with a low-caste child. I can only say that the members of this municipality have been born in an age too late. But what am I to say of the Syndicate of the

reformed Calcutta University. It or they, the singular number perhaps would be more appropriate, sympathetic on principle, with schemes for the extension of education but have great doubt as to the desirability of compulsion in matters of instruction specially with regard to girls and of the imposition of new taxes. They also fear that if Mr. Gokhale's Bill is passed it might divert the application of funds urgently required to meet the present needs and the legitimate expansion of University and Secondary education. Is not this, Gentlemen, as Sydney Smith says the invariable attitude of those who dislike a measure but are afraid or ashamed to say so openly. The Reformed Calcutta University has banished Burke but I hope it has not also sent away the father of English political economy to keep Burke company. I say so because Adam Smith, as every body who has not the honour of a seat in the reformed Syndicate knows, is distinctly of opinion that though the State ought not to meddle with the education of the rich, the education of the poor is a matter which deeply concerns the commonwealth. The Assam tea-planters and some landowners who neither toil nor spin are also I see greatly exercised in their minds over this measure. The planters fear that it could effect the supply of coolies to their gardens—gardens of Eden the Indian labourers' paradise, while the landowners are, I presume, afraid of being starved if they are compelled to pay an education rate. They have also threatened us that they would be unable in such case to subscribe lavishly towards memorials not always, I may add, of the most memorable. Gentlemen, I have done, but before I resume my seat I must say that few things have made a deeper impression on my mind than the saying of Victor Hugo: He who opens a school shuts up a prison. A still more distinguished Frenchman said when he was about to be hurried off to the guillotine, even at this incomprehensible moment on the fatal tumbrel itself with nothing free but my voice, I could still cry take care to a child though in rags that should come too near to the wheel, perhaps I may save his life, perhaps he may one day save his country.

THE HINDU UNIVERSITY —WHAT IT MEANS.

Every one will admit that there has been a great spread of education and diffusion of culture in the country through the liberal educational policy of the Government of India: and there is no doubt that this education has been of immense good to the people in many respects. But every system and measure has its shortcomings and imperfections and it would not be inconsistent to hold that the existing schemes of education as devised and directed by the state have certain defects, some of which, the rulers are not in a position to remedy through the already established Universities. The real apology for the establishment of new Universities in the country lies in this inadequacy of the present institution.

It is a truism in modern pedagogies that the education of an individual can be real and calculated to help forward, his natural thought-processes and instructive tendencies, is adopted to the world of facts and ideas in which he is brought up, and gradually leads him from the concrete and the known to the abstract and the unknown. The system education for the people should likewise take note of and utilise the historic ideals and traditions which make up its real and concrete universe of thought and action, and adjust itself to the requirements suggested by these predisposing circumstances.

Varieties and types of national character and civilisation depend on Religion, Literature Philosophy History and Science that the peoples evolve as they live and grow. These institutions of civilisation appear in many forms, and the forms vary with age and clime. And so in order that the education of people may be living and productive of real good a special importance is to be attached to the study of its religion, philosophy, literature and history. The consequence is that statesmen in the field of education have to recognise the possibility of different types of educational systems and institutions and the "relativity" of educational policies, and to conclude that a system may be very well adapted to one people so as to be of greatest good to it but quite unsuited to another people and may even be productive of evil consequences. The fact is one and the same university cannot meet the requirements of different peoples or of the same people in different ages. Every association of human being which is big enough to be called a people and which is old enough to have traditions which its members cherish and feel glory in, must therefore have a University of its own to direct and control its educational interests.

Who is there in the world to deny the separateness of Hindu Society from other societies of men. That it has certain special features which

have grown and developed in mass and volume through the ages that differentiate it from other systems of life and thought is also beyond dispute. The University, therefore, that supplies best the needs of other peoples is certainly not the institution that can preserve and further along lines of progress, the natural and national culture of the Hindu race. A separate University, therefore, which can focus and concentrate the forces of the Hindu world for the education of its youth, becomes a desideratum.

The Hindu University would then recognise the separateness and individuality of Hindu society and adapt its educational arrangements to its special needs and interests.

But it would not ignore the importance of the other cultures of modern times and of the orient world. The discoveries of man in diverse climes and times will of course be studied in the Hindu University, but only so far as they serve to illustrate, explain and verify the truths of Hindu Philosophy and Literature or bring out the differences and points of contrast or analogy with it so that ultimately it may grow in richness and variety.

Besides, the Scheme of Education as devised by the University is to be such as to make room for the new Sciences of the physical world even in the primary classes. It is believed that unless the results of the physical enquiries and the truth of the experimental sciences for which the West is mainly responsible can extend sway over Hindu Society, Hindus will remain imperfect in many respects, and be quite unable to grow and develop in the modern world as distinct specimens of culture. In addition to the training in the modern sciences the Hindu University would make facilities for the acquisition of these industrial arts and weapons with which the Hindu can be well equipped in the struggle for existence among nations. It would direct its attention to making an education in the arts and industries as well as a scientific manual training an integral position of general education in the lower classes and thus developing the practical aptitudes and constructive faculties of the learners at an early age. This programme is framed on the belief that unless the applied sciences and commercial knowledge can become important ingredients in the atmosphere of Hindu life for some time to come, the degeneracy of the Hindu race in wealth health and strength will be increasing cumulatively.

The special features of the Hindu University are thus the preservation and promotion of the individuality and separation of Hindu life and culture. This it seeks to attain in two ways. In the first place, it gives a special importance in its curriculum to a study of (a) Hindu Religion and (b) Hindu Literature, Philosophy and History primarily and secondarily of the literature, history and philosophy of the West, according to the Prin-

ciples of Educational Science regarding the proper relation between indigenous and foreign cultures by which the national Systems of Education are controlled and regulated in advanced community. In the second place, it makes provision for the "modern side" of education and incorporation of the best assimilable ideals of the West with the best traditions and ideals of the Hindus by emphasising the need for scientific, commercial and technical education in its system of instructions from the elementary stage upwards.

The Hindu University thus would not only be an additional university in the Indian Educational world of to-day and add to the educational opportunities of the people, especially of those "who have not availed themselves of the facilities offered by the State," but would come in to bring with it a distinctive ideal of its own viz the educational of the Hindu youth along the lines of his own natural evolution and the furtherance of the interests of Hindu civilisation along modern lines. We are concerned not merely with the number of students receiving education or the subjects in the curriculum of studies, but altogether new viewpoint from which to administer the problems of education and the lines of instructions. The Hindu University, like its sister institution the Moslem University, are thus to be new contributors to culture and civilisation of mankind.

The question of the need for the preservation of the Hindu type of life and thought along its own natural lines I have dwelt upon in a note furnished to Major B. D. Bose, I M S (Retired) of Allahabad in his paper on the propagation of Hindu Literature printed in the "Modern Review" for August 1911. Since it may be very well disputed if varieties of culture and civilisation are to be promoted and encouraged I quote below what I said in that connexion.

"There is another consideration which must appeal to every Hindu whose mind has been liberalised by Western education. I speak of the service to human thought and world's culture, to the interests of Science and Philosophy that may be done by the propagation of the Sacred Books of the Hindus and the diffusion of Sanskrit learning among the various sections of the educated world.

"Our appreciation of the rich heritage bequeathed to us by our ancestors may be attributed to that instinctive love of one's own, which in all ages and climes has been a powerful element in the race consciousness making every nation feel to be the chosen race of God. We may even be accused of a national vanity that prompts us to think highly of our own type of life and culture. And the wonder and admiration of the European pioneers of oriental learning excited by first contact with the spirituality and transcendental philosophy of the Hindus are likely to be easily

interpreted as some of the symptoms of that enthusiastic spirit of yearning after the Infinite, that 'devotion to something afar from the sphere of our sorrow,' which in the last decades of the 18th century, manifested itself under the name of Romanticism, in a reaction and revolt against the empirical and positive philosophy of the preceding generations, may possibly be looked upon by stern critics as necessarily blind and one-sided.

"There may be some truth in these charges and criticisms. But to philosophical historians and students of abstract science who are not swayed by utilitarian considerations of the value of national literature in a scheme of patriotic movement, and who cannot be actuated by motives of bringing about that rapprochement in thought between the East and the West which is sure to solve some of the actual problems of modern politics, the importance of facilitating inquiries into the institutions and theories that sprang up in the Hindu world is certainly immeasurable. These priests of the temple of science who approach learning in its manifold forms from the absolute and academic standpoint are at present in the greatest need of new facts and conditions and novel situations from which to attack the problems of their special studies. All human sciences, philology and mythology as well as economics and politics, in short, Sociology in both its narrow and wide senses, are labouring under great limitations and evident imperfections owing to the circumscribed range of observation to which the savants of the West have for want of opportunities been compelled to confine their study. To every orthodox European scholar, philosophy as well as general civilisation began with Greece, and in text books of the history of human culture it is the precursors of Plato and Aristotle that are described as the first seers of truths and civilisers of mankind, other systems of thought and discoverers of doctrines being roughly classified as 'oriental,' pre-economic or pre-political, and hence not worth the trouble and pains of an investigator. The result has been a lamentable lack of universality and catholicity in the doctrines and theories of Western scholars, which explains the slow progress of the human, judged by the rigid test of the physical and natural sciences. The relative truths of the present day social sciences have to be revised, modified

and corrected in the light of new problems that are likely to be presented by Hindu society and literature. The foundation of the comparative sciences according to a correct application of the principles of the Philosophico-Historical method which it has been the glory of the modern age to discover will "then" be laid on an adequate basis. Such is the consummation we expect by supplying fresh sociological data on which to build up real inductive generalisations through the publication and circulation of the unused literary legacies of the Hindu sages.

"Considered in this light, our scheme cannot command itself to every body who has his debt to repay to the goddess of learning. Scholars and educationists as well as patrons of learning should help forward the propagation of Hindu literature by the foundation of academies and research institutes. It is not only true that we should have seminaries and societies throughout the length and breadth of India where our classical literature may be studied and original investigation and research work may be carried on both in English and the provincial vernaculars, but we believe that it is also necessary and desirable that some of the first class universities of the modern world, "e. g." of Germany and America, England and Russia, as well as China and Japan, should have chairs founded by our efforts for the cultivation of Hindu philosophy and literature. We hope our educational missionaries will embark on this form of aggressive and adventurous patriotism in order to disseminate Hindu thought among the nations of the world and thus sow broadcast the seeds of a Twentieth Century Renaissance."

Of course the Hindu University cannot come into existence unless the Government of India agrees to be its supervisor and protector and funds are being raised on the "Express condition" that the subscriptions would be returned to the donors in case the Government do not sanction it. And the general administration must necessarily be in the hands of a Hindu Board of control. The holy city of Benares is proposed to be the site of the Central Colleges, and it is to be understood that Schools and Colleges in the mofussil that would come up to the standard required by the Hindu University and run along its lines will of course be affiliated to it.

The Universities.

CALCUTTA UNIVERSITY.

Candidates who wish to take up the alternative paper in English at the B. A. Examination in 1912 are required to read the following portions only of BRANDE'S SHAKESPEARE: Book I, Chapters 1 to 6, 14 to 16, 28 and 30; Book II, Chapters 1 to 4; Book III, Chapters 1 to 6, 11, 22 to 27.

The selections in PERSIAN prescribed for the I. A. and B. A. Examinations in 1912 are prescribed for the aforesaid Examinations in 1913 also.

For the benefit of unsuccessful candidates at the last Second L. M. S. Examination and students similarly circumstanced, the Senate sanctioned the holding of a supplementary second L. M. S. Examination in March 1912.

The Intermediate Examination in Arts and Science, Bachelor of Arts and Bachelor of Science Examinations for 1912 will begin on the 18th March 1912. The Matriculation Examination of 1912 will be held on the 4th March and following days.

The ensuing L. F. and B. T. Examinations will be held on Monday the 1st April 1912 and following days. Applications and fees for admission to the above examination must reach the Registrar on or before 19th February 1912.

The ensuing Preliminary Scientific, First and Second M. B. Examinations will be held on Monday the 18th March 1912 and following days. Applications and fees for admission must reach the Registrar on or before the 4th March 1912.

The Senate accepted the recommendation of the Syndicate and appointed Mr. B. K. Acharyya B. A., L. L. B., Bar-at-Law, as Tagore Law Professor for 1912. The subject of his lectures will be "Codification in British India."

The under-mentioned gentlemen are appointed University Lecturers in the respective subjects under which their names appear:—ENGLISH.—Mr. F. S. Sterling, M. A.; Mr. J. W. Holme, M. A.; and Mr. J. N. Das Gupta B. A. ECONOMICS.—Mr. W. C. Wordsworth, M. A.; and Mr. J. C. Coyajee M. A. MATHEMATICS.—Dr. D. N. Mallick, D. Sc., F. R. S. E.; and Dr. Svaminadas Mukerjee M. A., PH. D.

The following gentlemen have been appointed by the Senate to set questions at the Paper Setters, Matriculation, Intermediate, B. A. and 1912 B. Sc. Examinations of the Calcutta University for the year 1912.

MATRICULATION.

ENGLISH.—Hon'ble Mr. Justice Mookerjee (*The Vice Chancellor*), Mr. J. N. Das Gupta, Dr. G. Thibaut (*Registrar*) and Rev. J. Power. They will also set the vernacular paper for translation.

BENGALI.—SH. GOOROO Das Bannerjee, and Mr. Justice Mookerjee.

HINDI.—Dr. Thibaut and Pande Ramavatar Saini.

URDU.—Messrs. Modhusadhan Das and Kasi Nath Das.

URDU.—Maulvi Mahomed Mustapha Khan and Mr. Monohar Lal.

BERGESS.—Mr. W. G. W. Spoon and Maung Ten Un Sin.

ASSAMESE.—Messrs. Nabin Chandra Bardoloi and Padmanath Barooa.

MATHEMATICS.—Mr. Justice Mookerjee, Dr. Svaminadas Mookerjee, and Prof. Kalpada Basu.

SANSKRIT.—Messrs. Nishintha Chandra Mukerjee, Bhagabat Kumar Goswami Shastri and Hari Charan Ganguly.

PALI.—Dr. Satis Chandra Vidyabhushan, C. D. Seal, Esq., and Babu Nilmoni Chakravarty.

ARABIC.—Dr. E. Denison Ross, Mahomed Munshi, and Maulvi Shams-ul-ulama Ahmed.

PERSIAN.—Dr. Ross, Maulvi Kamal-ud-din Ahmed and Shams-ul-ulama Mirza Ashrafi Ali.

BENGALI (for females).—Babus Dimesh Chandra Sen and Jogindia Nath Bose.

URIYA (for females).—Messrs. **Modhusudan Das** and **Kasi Nath Das**.

HINDI (for females).—Dr **Thibaut** and **Pande Ramavatai Sarma**.

COMPOSITION.—**Babu Dinesh Chandra Sen** and **Dr. Satis Vidyabhushan** (Bengalee); **Dr. Thibaut** and **Paran Chand Nahar** (Hindi); Messrs. **Madhusudan Das** and **Kasi Nath Das** (Uriya); Messrs. **N. C. Bardoloi** and **P. N. Barooah** (Assamese) **Maulvis Mahomed Cassim** and **Mahomed Mustafa** (Urdu)

HISTORY.—**Profs. Adhar Chandra Mukherjee** and **Binayendra Nath Sen**.

GEOGRAPHY.—**Rev. W. G. Brockway** and **Babu Biraj Mohan Majumdar**.

ELEMENTARY MECHANICS.—**Rai Kumudinikanta Banerji** **Bahadur** and **Babu Haran Chandra Banerji**.

INTERMEDIATE EXAMINATIONS.

ENGLISH.—**Prof. H. Stephen**, **Dr. Thibaut**, and **Rev. Father E. O'Neill**.

ALTERNATIVE PAPER.—**Prof. Stephen** and **Mr. J. N. Das Gupta**.

COMPOSITION.—**Babus Dinesh Chandra Sen** and **Kokileswar Bhattacharyya** (Bengali); **Dr. Thibaut** and **Pande Ramavatai Sarma** (Hindi); **Mr. Kasi Nath Das** and **MM. Sadasiva Kabyakantha** (Uriya); Messrs. **Hem Chandra Goswami** and **Nobin Ch. Bardoloi** (Assamese); **Mr. Hedayet Hossain** and **Mouvie Mahomed Mustafa Khan** (Urdu).

CHEMISTRY.—**Rai Bahadur Dr. Chunilal Bose**, **Dr. Caldwell**, **Babu Chandra Bhushan Bhaduri**.

MATHEMATICS.—**Mr. Justice Mookerjee**, **Dr. Syamadas Mookerjee**, **Prof. Indu Bhushan Brahmachari**.

PHYSICS.—**Principal Ramendra Sundar Trivedi**, **C. W. Peake, Esq.** **Dr. D. N. Mallik**.

BOTANY.—**Prof. P. J. Bruhl**, **Mr. S. C. Mahalanobis** and **Mr. W. Smith**.

GEOGRAPHY.—**Mr. W. H. Arden Wood**, **Principal Ramendra Sundar Trivedi** and **Mr. W. H. Griffiths**.

PHYSIOLOGY.—**Dr. Nilratan Sircar**, **Dr. Upendra Nath Brahmachari** and **Capt. D. Mackay**.

SANSKRIT.—**Pande Ramavatai Sarma**, **MM. Kali Prasanna Bhattacharyya** and **Babu Muralidhar Banerji**.

PALI.—**Dr. G. Thibaut**, **Dr. S. C. Vidyabhushan** and **Babu Revati Nath Chatterji**.

ARABIC.—**Shams-ul-Ulamas Ahmed** and **Abu Nasir Wahed**, and **Maulvi Kamaluddin Ahmed**.

PERSIAN.—**Shams ul-Ulama Mirza Ashraff Ali**, **Maulvi Mahomed Kazim Shiraji** and **Lieut.-Col. D. C. Phillott**.

BENGALI (for females).—**Babus Jogindra Nath Bose** and **Dinesh Chandra Sen**.

HISTORY.—**Mr. W. A. J. Archbold** and **Babus Binoyendra Nath Sen** and **Bepin Behari Sen**.

LOGIC.—**Prof. H. Stephen**, **Mr. Jnan Ranjan Banerji**, and **Babu Adhar Chandra Mookerji**.

B. A. EXAMINATION.

ENGLISH.—(Pass)—**Mr. J. N. Das Gupta**, **Rev. Father O'Neill** and **Rev. J. Power**; (Honours)—**Mr. A. J. Yate**, **C. H. Tawney, Esq.** and **Mr. I. Gollanez**. (Advance Paper)—**Mr. Heramba Chandra Maitra** and **Rev. E. M. Wheeler**.

COMPOSITION.—**Babus Dinesh Chandra Sen** and **Akhoy Chandra Sircar** (Bengali); **Dr. Thibaut** and **Pande Ramavatai Sarma** (Hindi); **Mr. Kasi Nath Das** and **MM. Sadasiva Kabyakantha** (Uriya); Messrs. **Hem Chandra Goswami** and **N. C. Bardoloi** (Assamese); **Mr. Hedayet Hossain** and **Moulvi Mustafa Khan** (Urdu).

SANSKRIT.—**Babus Nrisinha Mukerji**, **Abinash Ch. Guha**, **Dr. S. C. Vidyabhushan** (Pass); **Babus Rajendra Lal Shastri** and **Brajlal Chakravarty** and **Dr. Thibaut** (Honours).

PALI.—**Dr. Thibaut**, **Dr. Vidyabhushan** and **Babu Revati Nath Chatterji**.

ARABIC.—**Shams-ul-ulamas Ahmed** and **Abu Nasr Wahed** and **Dr. Suhrawardy**.

PERSIAN.—**Lieut. Col D. C. Phillott**, **Shams-ul-ulama Ahmed**, **Dr. Suhrawardy**.

HISTORY.—(Pass and Hon.) Messrs. **J. N. Das Gupta**, **W. A. J. Archbold** and **M. N. Bose**.

POLITICAL ECONOMY AND POL. PHILOSOPHY.—(Pass and Hon.) Messrs. **J. N. Das Gupta**, **Monohar Lal**, **Dr. J. V. Ryan**.

MENTAL AND MORAL PHILOSOPHY.—Messrs. **Binoyendra Nath Sen**, **Manohar Lal** and **Rev. E. M. Wheeler** (Pass). Messrs. **P. K. Chakravarty**, **Binoyendra Nath Sen** and **W. C. Wordsworth** (Honours).

B. Sc. EXAMINATION.

MATHEMATICS.—**Mr. Justice Mookerjee**, **Babus Abinash Chandra Bose** and **Phanindra Nath Ganguly** (Pass); **Mr. Justice Mukerji**, Messrs. **Ganesh Prasad**, **R. P. Paranjpe** **Mahendra Nath Roy**, **Abinash Bose**, **Phanindra Nath Ganguly** (Honours).

PHYSICS.—**Prof. P. J. Bruhl** and **Principal R. S. Tiwedi**.

CHEMISTRY.—**Dr. W. A. K. Christie** and **Mr. Jatindra Nath Sen**.

PHYSIOLOGY.—**Dr. Nil Ratan Sarkar**, **Dr. Upendranath Brahmachari**, and **Mr. B. C. Ghose**.

BOTANY.—**Mr. I. H. Burkill**, **Mr. S. C. Mahalanobis** and **Prof. P. J. Bruhl**.

GEOLOGY.—**Prof. P. J. Bruhl**, **Mr. Feimor**, and **Mr. H. H. Hayden**.

M. A. & M. Sc. RESULTS

The undermentioned candidates passed the
M. A. Examination, 1911 (in
order of merit)—

English (A). *Class I*:—Kaliprasad Khaitan, Susil Kumar De, (Presidency College). *Class II*:—Sudhindra Kumar Halder, Prabodh Chandra Datta, Surendra Chandra Gupta, (Presidency College), Sarat Chandra Gupta (Non-Collegiate Student), Jiteshchandra Guha and Harendra Krishna Sarkar (Presy. Coll.). Krishna Behari Gupta (Non-Collegiate), Khetrajada Basu, Jnanendra Nath Dutta, Satindranarayan Ray (Presy. Coll.). *Class III*:—Santosh Kumar Basu (Presy. Coll.), Mamatha Nath Chatterji (Non-Collegiate), Saradindu Mukerji (Presy. Coll.), Nalini Mohan Chatterji and Syed Mohamed Moimul Haq (Non-Collegiate); Hemendra Nath Chatterji, Jnanendra Nath Chaudhuri, Birendra Chandra Deb, Bhudeb Chandra Kar, Sasipada Saha (Presy. Coll.), Brajendra Kumar Sen (Non-Collegiate), Rajendralal Raychaudhuri, Abdul Haliz, Ambika Prosad Upadhyay, Manilal Mukerji (Presy. Coll.), Kumud Chandra Chakravarti (Non-Collegiate), Prabhat Chandra Ghose (Presy. Coll.).

English (B). *Class III*:—Prakas Chandra Mukerjee (Non-Collegiate Student).

Sanskrit (A). *Class II*:—Bhagirat Chandra Das (University Student); Sibaprasad Bhattacharji, Girindranarayan Mallik (Non-Collegiate), Akhay Kumar and Rajendra Kumar Bhattacharyya (University Students). *Class III*:—Mokhada Charan Bhanmik (University Student).

Sanskrit (C). *Class I*:—Pasupatinath Bhattacharyya (University Student).

Pali, *Class II*:—Lalit Mohan Kar (University) Maung Tin (Non-Collegiate).

History. *Class I*:—Subodh Ch Mukherji, Ramesh Chandra Majumdar (Presy. Coll.) *Class II*:—Nimaichand Sil (University); Makhanlal Datta (Presy. Coll.), Nripendra Kumar Datta (University), Bhubanmohan Lahiri (Presy. Coll.), Gijja Bhushan Mukherji (University) Subimal Ch. Sarkar (Non-Coll.), Upendranath Ray (University), Bijay Kumar Chatterji, Satya Charan Laha, Nakuleswar Mukerji (Presy. Coll.) *Class III*:—Jnanendra Nath Maitra, Sailendra Nath Banerji (University), Dhirendranath Guha, Manindra K. Basu (Non-Coll.), Nagendra Chandra Chaudhuri (Presy. Coll.), Amarnath Datta (University), Lalimohan Ray (Non-Coll.), Bishnu Chandra Baruya (Presy. Coll.), Bamacharan Ray, Dwijendranath Datta, Surendra Chandra Ray Chaudhuri (University), Karunakumar Chatterji (Non-Coll.), Rakhaladas Chatterji (University).

Philosophy. *Class II*:—Satish Chandra Sen (Non-Coll.), Nagendra Chandra Ganguli, Kshitish Chandra Ganguli, Kumudbandhu Chakravarti, Pramodnath Basu, Jatindra Mohan Chaudhuri

(Scottish Churches' College), Bhabataran Chakravarti, Saileswar De (Non-Coll.) *Class III*:—Nilkantha Das, Prasantabhushan Gupta (S. C. College), Indranarayan De, Amarlal Chandra (Non-Coll.), Ramprasad Mukherji, Aswini Kumar Ganguli, Ushakanta Mukherji, Stinath Ghosh, Harendranath Rai Chaudhuri (S. C. College), Ramesh Chandra Sur (Non-Collegiate Student).

Political Economy (A) *Class I*:—Bhujangabhushan Mukherji (Presy. Coll.). *Class II*:—Kaliprasanna Piplai, Santinay Majumdar, Chandra Sekhar Sen (Presy. Coll.), Prapulla Chandra Basu, Baidya Nath Narayan Sinha (Non-Coll.), Girindranath Sarkar and Kausiknath Bhattacharyya (Presy. Coll.). *Class III*:—Mangla Prasad (Presy. Coll.), Abdul Majid (Dacca Coll.), Mamatha Mohan Basu, Shamsouzzoha Ahmed (Non-Coll.), Harendra Kumar Dutta Chaudhuri (Presy. Coll.), Dhanapati Nath Das (Dacca Coll.), Narendra Narayan Chakravarti (University).

Political Economy (B) *Class I*:—Nirmal Chandra Chandra (Presy. Coll.) *Class II*:—Girija Sankar Ray Chaudhuri (Presy. Coll.); Manindra Bhushan Datta, Tarak Nath Basu (University). *Class III*:—Fazlul Haque, Suresh Chandra Bardhan, Tapendra Nath Ray, Upendra Nath Bal, Nagendra Behari Sen Gupta (Presidency College).

Pure Mathematics. *Class II*:—Suniti Kumar Pal (S. C. College); Tulsī Prasad Mitra, Jatindra Chandra Datta (Non-Coll.). *Class III*:—Nibarān Chandra Pal (Non-Coll.); Narayan Das Banerji, Satindra Nath Ray Chaudhuri, Jatindra Mohan Pal (S. C. College).

Mixed Mathematics. *Class I*:—Basanta Kumar Chatterji, Gopendra Nath Das (Presy. Coll.). *Class II*:—Durga Prasanna Bhattacharyya, and Narendra Nath Chatterji (Presy. Coll.). *Class III*:—Surendra Nath Maitra (Presy. Coll.).

Physics. *Class II*:—Naresh Chandra Ray (University). *Class III*:—Binod Chandra Sen (University).

The undermentioned candidates have passed the
M. Sc. Examination (1911) in order of merit:—

Pure Mathematics. *Class I*:—Harshanath Sen and Manindra Nath Set (S. C. College).

Mixed Mathematics *Class I*:—Satish Chandra Kar, Karunamay Khastgir (Presy. Coll.).

Physics. *Class II*:—Abanibhushan Das, Amar Nath Palit, Kailash Chandra Chakravarti (University). *Class III*:—Urukramdas Chakravarti (University).

Geology. *Class II*:—Manmatha Nath Halder (University Student).

Engineering Examinations Results, 1911.

B. E. Examination: Second Division, (in order of merit)—Surendra Mohan Chaudhuri, Pravat Chandra Ray, Nanigopal Bose, Sarat Chandra Chakravarti, Prafulla Krishna Mitra, Jatindra Sen Gupta and Jadugopal Mukherji, Srish Chandra Mitra, (C. E. College, Sibpur) Aswini Kumar Set (Ex. student), Lalit Mohan Laha and

Promotha Nath Banerji, Abinash Chandra Basak, (C. E. College, Sibsipuri), Bhabendra Nath Majumdar (Ex-student)

I. E. Examination : (*In order of merit*)
Kumud Bhushan Ray, Patit Paban De, Amal Chandra Sen, Satya Bhushan Mitra, Joges Chandra Gubathakurta, Abdul Goffar, Joykumar Sarker, Dyananda Bhattacharyya, Harendra Nath Joaddar, Pulin Bihari Das, Surendra Nath Ray (C. E. College, Sibsipuri).

F. E. Examination : Second Division :
Satish Chandra Chatterji (Ex-student).

On the results of the ensuing Matriculation Examination of 1912, the two second grade junior scholarships attached to Chota Nagpur Division will be awarded to the two boys who stand highest in the Divisional list, irrespective of the districts they come from, and the five third grade junior scholarships will be distributed as follows :—Hazaribagh, 1 ; Ranchi, 1 ; Palamanu, 1 ; Manbhum, 1 ; Singhbhum, 1.

The third grade junior scholarships allotted to the Rajshahi Division will be distributed on the result of the ensuing Matriculation Examination in 1912, as follows :—Rajshahi—2 ; Dinajpur—1 ; Jalpaiguri—1 ; Rungpore—1 ; Bogra—1 ; Pabna—2 ; Maldah—1 ; Besides above there is one special scholarship of the third grade open to competition among students of all high schools in Rungpore district.

The seven third grade junior scholarships allotted to Tirhut Division to be distributed thus :—Saran—2 ; Champaran—1 ; Muzaffarpur—2 ; Darbhanga—2.

Six Junior scholarships of the second grade and twelve of the third grade have been allotted to the Presidency Division to be awarded for the Matriculation Examination 1912. The second grade scholarships will be awarded to those candidates who take the highest places in the Divisional list irrespective of district. The third grade scholarships will be distributed thus :—24 Parganas—4, Nadia—2, Murshidabad—2, Jessore—2, Khulna—2.

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The undermentioned candidates will be per-

mitted to appear at the M. A. or M. Sc. Examination as Non-Collegiate students in the year stated against the name of each :—Basantakumar Chatterji 1912 ; Jiban Krishna Banerji 1913 ; Radhasyam Dey 1914 ; Ranjanlal Sen 1912 ; Jnanendra Nath Chatterji 1913 ; Sushil Chandra Lahiri 1912 ; Satyaprasanna Bhattacharyya 1912 ; Nisikanta Sen Gupta 1912 ; Suresh Chandra Chakravarti 1914 ; Makhanlal Banerji 1912 ; Indubhushan Sen Gupta 1912 ; Gurudas Gupta 1912 ; Kiran Chandra Majumdar 1912 ; Rajkumar Das 1913 ; Sasadhar Banerji 1914 ; Manoranjan Ghosh 1912 ; Khirad Chandra Purkayastha 1912.

At a special meeting of the Senate of the Calcutta University, the Syndicate proposed that a loyal address be presented to His Majesty the King-Emperor, by the Senate of the University on the occasion of His Majesty's visit to Calcutta. There was a large attendance and the Hon'ble the Vice-Chancellor Dr. Mukherji, who presided, in the course of an eloquent address said, "the University of Calcutta in presenting the Address may well be allowed to view itself as the representative of the entire body of the Indian Universities, for so far as I am aware of, no other University will enjoy a similar privilege. On us here in Calcutta will thus devolve the honourable and at the same time responsible task of being spokesman for the Indian Universities in general, and, if we take a survey of our position even wider, but not I think altogether unjustified, for that whole section of the people of India that has received a University education." Speaking of the special standing of the University in this matter Dr. Mukherji said that it was not the first time that His Majesty would meet the members of the University, for less than six years ago they had already enrolled His Majesty as one of their Honorary Doctors of Law, and recalled to mind the visit of His late Majesty Edward VII, then Prince of Wales who became the first Honorary Doctor of Law of the University in 1876. Dr. Mukherji then

dwelt at length on the diffusion of Western knowledge in India and the task of the Universities in this respect. He said that all the great Universities of the country owed their existence to the initiative of the Government which never failed to extend to them generous help and benevolent patronage, and paid heart-felt gratitude to those benevolent Rulers who had given them unrestricted access to all the treasures of Western knowledge, learning and science. Dwelling on the duties of Universities he said, "Let us assure our Emperor, that the Indian Universities while cherishing the legitimate ambition of being the leaders in a boundless advance of their country in enlightenment and knowledge, are no less anxious to act as centres of stability—moral, social and political; that they view it as a Supreme duty to strengthen the bond which connects India and Great Britain".

Sir Goroobass Benerjee seconded the resolution. Mr. Stephen, on behalf of the non-official European community, Moulvie Seraj ul Islam, on behalf of the Mahomedans, Mr. M. S. Das, Prof. Manohar Lall and Moulvie Mohammad Yusuf supported and the resolution was carried.

MADRAS UNIVERSITY.

Under the Indian Universities Act, the Chancellor of the University of Madras is pleased to

nominate the following gentlemen to
Fellows be ordinary fellows of the Madras University: (1) Surgeon-General

William Burney Bannerman M.D., F.R.C.S., Offg. Surgeon Genl. with Madras Government (2) Lieut. Col. Gerald Godfrey Gifford, M.R.C.S., L.R.C.P., F.R.C.S., Professor of Midwifery, Medical College and Superintendent Maternity Hospital Madras, (3) The Rev. Charles Isaac Garziz, S.J., B.A., B.D.

Lieut.-Col. R. Robertson, M.D., F.R.C.S., received the largest number of votes at a recent election of a member of the Syndicate.

The following resolution of the Syndicate

passed at a recent meeting is published for general information: "Resolved that the Syndicate will be prepared to recommend exemption from the production of attendance certificates required for B.A.

Degree Examination under the old Bye-laws to candidates who would in other respects have been eligible for exemption under bye-law 150 (c) and who will have completed their twenty third year before the 20th March preceding the Examination". Applications for such exemption from candidates who have passed the F. A. Examination of this University and who will have completed their twenty third year before 20th March preceding the examination should be made to the Registrar so as to be received in the Senate House before the 1st October preceding.

Add the following as the second sentence of Rule 70 of the revised rules of the College of Engineering published in No. 74 of Part I—B of the Fort St. George Gazette dated 11th February 1911—

Unless specially exempted by the Principal no student will be allowed to appear for any College examination if he has been absent without leave from a prescribed survey camp or has failed to attend the College for at least four-fifths of the working days in the preceding college career.

Applications are invited by the Inspectors of European Schools, Madras and Bangalore, for two Scholarships of the monthly value of Rs 20 and tenable for 2 years in an affiliated college of the University, open for award to European and Eurasian students. The candidates must have passed the Intermediate Examination of the Madras University. Applications should be submitted through the Principal of the College in which the applicant desires to continue his studies. The scholarships will be awarded on the results of the Intermediate Examination.

**Scholarships for
Europeans
& Eurasians**

BOMBAY UNIVERSITY.

Mr. Wedgewood asked the Under-Secretary of State for India: Whether his attention has been called to the action of the Governor of Bombay **question in Parliament** in warning the Senate of the Bombay

University against retaining English History as a compulsory subject for the examination for a B. A. degree. What are the grounds of this action; and has it the sanction of the Secretary of State? Mr. Montague replied: I understand that the Senate proposed to substitute the history of England 'political and constitutional' as an obligatory subject for the present group 'history and political Economy', which includes the history of England, the history of India, and political economy. The Bombay Government think that the proposed change would encourage cramming, and have in the ordinary course put their opinion before the Senate of the University. There was no necessity for their consulting the Secretary of State before doing so.

At a meeting of the Senate of the Bombay University, the following amendment put forward

by Mr. Natarajan, against the report of the committee regarding the revision of the Arts Course, was passed after a long debate by a majority voting for it. (a) That in respect of para. 6 of the report the Senate on reconsideration of the matter is of opinion that subjects for the B. A. Examination should be (1) English and (2) Voluntary Group; (b) That History of England, political and constitutional, should form the part of the voluntary group 'History and Economics' and (c) That the Senate request the Syndicate to revise the proposed regulation accordingly.

The Senate has with the sanction of Government made the following additions to and alterations in the existing University Regulations:—The following section has

changes in regulations been inserted after Regulation 153 (page 56 of the Calendar for 1910-11). "XX.-RECOGNITION OF EXAMINATIONS HELD BY PUBLIC BODIES. Para 154. The Matriculation Examination of those

Indian Universities which recognise the Matriculation Examination of this University and have the same age limit for admission to it that obtains in this University is considered equivalent to the Matric. Examination of this University (Under the provision of this regulation the Matriculation Examination of the Calcutta and Allahabad Universities is considered equivalent to the Matric Examination of this University. Matriculation examination of Madras and Panjab Universities is not considered so equivalent) Para 155. The European High School Examination is considered equivalent to the Matriculation Examination of this University provided that a candidate who wishes to take advantage of this equivalence has completed 16 years of age on or before 31st December of the year in which he presents himself for the High School Exam. Para 156 The Oxford and Cambridge Senior Local Exams. are each considered equivalent to the Matric. Exam. of this University provided that the selected subjects of a candidate who wishes to take advantage of this equivalence, include English, a Second language, History and Geography, Mathematics and one of the science subjects and that he has completed 16 years of age on or before 31st December of the year in which he presents himself for the Oxford and Cambridge Senior Local Exams."

The words "Kannese, Gujarati and Urdu" have been substituted for the words "Kannese and Gujarati" in paras 1 and 5 (p. 91 of Calendar).

The following has been substituted for lines 5-8 and lines 33-36 page 1 agenda and corrigenda to 1911-Calendar:—"To pass the examination the candidate must obtain in each subject 25 per cent of the total number of marks obtainable in Practical Examination and 33 $\frac{1}{3}$ per cent of the total number of marks obtainable in the written and practical examination. Those of the successful candidates who obtain 66 per cent of the total marks obtainable will be placed in the first class.

The following gentlemen will conduct the medical examinations :—*Preliminary Scientific M. B.*

Examiners CHEMISTRY : Major W. H. Dickinson and Mr. D. R. Bardi. BIOLOGY : Mr. T. D. Velankar, Mr. B. P. Kainani. PHYSICS : Messrs L. L. Joshi and V. B. Divatia. *Intermediate M. B., B. S.* :—ANATOMY, Major T. S. Novis and Captain J. Morison. PHYSIOLOGY and HISTOLOGY : Major Hutchinson and Mr. F. D. Nanavali. MATERIA MEDICA and PHARMACOLOGY : Major A. W. Tuke and Dr. E. Moses. *Second L. M. S.* :—ANATOMY : Mr. S. D. Bhaiucha and Major Novis. PHYSIOLOGY and HISTOLOGY : Major Hutchinson and Mr. F. D. Nanavali.

Meetings of the above examiners presided over by Dean of Faculty of Medicine or in his absence Senior Fellow of Examiners present will be held in University Library on the undermentioned days to determine the results of the Examinations. *Preliminary* and *Intermediate* : 3rd October. *Second L. M. S.* : 13th October.

PUNJAB UNIVERSITY.

The name of Mr. N. G. Welinkar, Principal Dyal Singh College has been added as **Fellow** a fellow subsequently to a meeting of the syndicate and he was assigned to the Arts faculty.

Mr. B. N. Sen was appointed University Auditor.

In addition to the pass (including practical examination) in each subject there shall be set in English, Mathematics, Astronomy, Zoology, Botany and Geology two **B. Sc. Regulations** honour papers; in Mineralogy one honour paper and an honour practical examination; in Physics, Chemistry and Geology two honour papers and an honour practical examination. Two hundred marks shall be allotted to the honour papers (including practical examination) in each subject.

The following are the courses of Philosophy for the different Examinations of 1913 :—

Philosophy courses for 1913 INTERMEDIATE ARIS. (a) Psychology—Buell's 'Essentials of Psychology'. (b) Logic—Stock's 'Logic'. B. A. EXAMINATION.—*First Paper* (a) James' 'Text Book of Psychology' (b) Carveth Read's 'Logic'. *Second Paper* (c) Mackenzie's 'Ethics' (d) Caird's 'Natural Theology'. *Honours* : 1st Paper—Mayor's 'History of Ancient Philosophy', Berkeley's 'Dialogues'; 2nd Paper—Fullerton's 'Introduction to Philosophy'.

M. A. EXAMINATION :—A. Revision of B. A. Course. B. (1) *Psychology*—James' 'Principles of Psychology', Watson's selections from Kant, Stout's 'Analytic Psychology', Ribot's 'English Psychology', Villa's 'Contemporary Psychology' (2) *Logic*—Mill's 'Logic', Bosanquet's 'Essential of Logic', Pearson's 'Grammar of Science', Venn's 'Empirical Logic'. (3) *Ethics*—Aristotle, Kant's 'Metaphysics of Ethics', Green's 'Prolegomena to Ethics', Mill's 'Utilitarianism', Sidgwick's 'Methods of Ethics', Sorby's 'Recent Tendencies in Ethics'. (4) *History of Philosophy*—Weber's 'History of Philosophy', Taylor's 'Elements of Metaphysics', Max Muller's 'System of Indian Philosophy', Sidgwick's 'History of Philosophy'. (5) *Natural Theology*—Martineau's 'Study', Tiele's 'Gifford Lectures', Deussen's 'Philosophy of Upanishad'.

Head Examiners for Matriculation Examination 1912 : ENGLISH. (a) Grammar and Translation into Vernacular—Lala Ram Prasad **Matric. Head-Examiners** Khosla M. A. (b) Composition, Translation into English and Oral Papers—Maulvi R. Sirajuddin B. A. HISTORY—Principal N. G. Welinkar. GEOGRAPHY—Principal H. T. Knowlton. ARITHMETIC and ALGEBRA—Lala Mukund Lal M. A. Practical and theoretical Geometry—Mr. D. N. Bhattacharji M. A. PHYSICS—Lala Mohan Lal, B. A., B. L. CHEMISTRY—Mr. R. S. Lala Ruchi Ram Sahni, ORAL PAPER—Mr. P. G. Shah B. Sc. PERSIAN—Principal Abdul Hamid and Mr. K. M. Maitra M. A. URDU—Mr. Sheik Abdul Qader, B. A.

The following is the list of Examiners appointed by the Syndicate for the **Examiners**. Intermediate in Arts and Science, B. A. and B. Sc., M. A. and M. Sc. and Matriculation (Science Faculty) Examinations of the year 1912.

INTERMEDIATE.

ENGLISH. (a) Messrs. E. Tydeman and J. G. Gilbertson, M. A. (b) Messrs. A. Hargreaves and F. R. Tomlinson B. A.; *Special Paper*—Principal H. Y. Langhorne.

MATHEMATICS. (a) Profs. S. N. Das Gupta M. A. and Lala Devi Dayal B. A. (b) Profs. Gopal Singh Chawla and Lala Suraj Bhan.

HISTORY—Principal Hansraj and Prof. G. A. Wathen.

LOGIC—C. Saunders, Esq. M. A.

PSYCHOLOGY—R. Sanderson, Esq. I. E. S.

PHYSICS—Prof. P. C. Mukherji, M. A. and Rev. D. J. Fleming M. A., M. Sc.

CHEMISTRY—Lala Khushi Ram and Mr. R. M. Ruchi Ram Sahni.

BOTANY, ZOOLOGY—Prof. C. C. Caleb M. B., B. S.; Mr. J. H. Mitter B. Sc.

LATIN—H. A. Smith Esq. M. A., I. C. S.

FRENCH—Monsieur Louis Peltier B. A., B. Sc.

SANSKRIT—Dr. V. A. Sukhtankar, Ph. D. and Lala Gulbahar Singh, M. A.

ARABIC—Maulvi M. Abdul Jalil and Dr. Shaikh Md. Iqbal, M. A., Ph. D.

PERSIAN—Maulvi Mahammad Din, B. A. and Mr. Syed Jalaluddin Hardi, M. A.

Physics Practical—Mr. A. S. Hemmy, M. Sc.

Chemistry Practical—B. M. Jones, Esq. M. A.

Botany Practical—Mr. C. C. Caleb.

Zoology Practical—Major Stephenson.

GEOLOGY—Prof. M. Aziz, Mr. A. S. Hemmy.

B. A. EXAMINATION.

ENGLISH. (Pass and Hon.) (a) J. Kelly, Esq. B. A., Rev. Marcus Wigram. (b) F. A. Leslie Jones, Esq., Rev. W. G. Roberson, M. A.

PURE MATHEMATICS. Principal Pranje (Poona) and Mr. Balak Ram, I. C. S. *Honours*. Principal Pranje and Dr. Syama Das Mukherji (Calcutta).

PHYSICS (Pass and Hon). Dr. E. P. Harrison (Calcutta) and Dr. Preston H. Edwards (Allahabad). *Practical*—Mr. A. S. Hemmy and Rev. D. J. Fleming, M. A., M. Sc.

BOTANY—Mr. C. C. Caleb and Dr. Milne.

APPLIED MATHEMATICS—Principal Pranje and Dr. D. N. Mallik (Calcutta). *Honours*—Dr. Syamadas Mukherji and Mr. Balak Ram.

CHEMISTRY—Messrs J. H. Barnes and A. R. Normans.

HISTORY—Rev. C. F. Andrews M. A. and Rev. H. J. Hoare.

ECONOMICS—Mr. Manohar Lal (Calcutta) and J. R. Cornah, Esq.

PHILOSOPHY—Principal Venis (Benares); Dr. Sheikh Md. Iqbal Bar-at-Law.

ZOOLOGY—F. H. Gravely, Esq. M. Sc., Captain S. E. Lloyd (Calcutta); Major Stephenson and Mr. S. K. Dutta.

LATIN—H. A. Smith Esq. I. C. S.

SANSKRIT—Principal K. P. Trivedi and Pandit Hiranand Shastri, M. O. L.

ARABIC—Dr. Suhrawardy (Calcutta) and Prof. Mufti Md. Anwar-ul Haq, M. A. (Bombay).

PERSIAN—Lt. Col D. C. Phillott and M. Syed Abul Baql. M. A. (Aligarh).

B. Sc. EXAMINATION.

ASTRONOMY—Dr. D. N. Mallik and Mr. Ziauddin Ahmed.

MATHEMATICS—(Statics and Dynamics)—Principal Pranje. Rest as for B. A.

PHYSICS—*Practical*, Mr. A. S. Hemmy and Rev. J. J. Fleming.

CHEMISTRY—*Practical*—Messrs B. M. Jones and P. G. Shah.

GEOLOGY—The Prof. of Geology, Presy. Coll. Calcutta, Messrs Hemmy & D. N. Wadia (Jammu).

M. A. EXAMINATION.

English—Principals Robson and Ewing, and Rev. C. F. Andrews.

PHILOSOPHY—Messrs. Manohar Lal and C. Saunders, M. A., Rev. Dr. H. D. Griswold.

HISTORY—Rev. Griswold, Prof. Wathen and Principal Martin.

ECONOMICS—Messrs Manohar Lal and G. A. Wathen and the Prof. of Economics Government College Lahore.

MATHEMATICS—Profs N. G. Feather, Gopal Singh Chawla and S. N. Das Gupta.

SANSKRIT—Dr. D. B. Spooner, Principal Venis and Pt. Hiranand Shastri.

ARABIC—Dr. Joseph Horovitz (Aligarh) and Mr. R. F. Azoo (Board of Revenue, Calcutta).

M. Sc. EXAMINATION.

PHYSICS.—Rev. D. J. Fleming, Mr. A. S. Hemmy and Dr. Harrison.

CHEMISTRY.—Messrs A. S. Hemmy, J. H. Barnes and B. M. Jones.

ZOOLOGY.—Mr. Stanley Kemps, Major Stephenson and Mr. F. H. Gravely.

PHYSIOLOGY.—Prof. C. C. Caleb, Captain McCay (Calcutta) and Prof. of Physiology Medical College (Bombay).

BOTANY.—Messrs. D. Milne and C. C. Caleb,

MATRIC. (SCIENCE FACULTY).

PHYSICS.—Lala Chetan Anand.

CHEMISTRY.—R. S. Lala Ruchi Ram Sahni,

ORAL AND PRACTICAL—Lala Sham Chand.

BOTANY AND ZOOLOGY.—Lala Behari Lal Bhatia. DRAWING—Sardar Bahadur Bhai Ram Sinha and Principal Mayo School.

AGRICULTURE.—R. S. Lala Ruchi Ram Sahni,

PHYSIOLOGY AND HYGIENE—Mr. S. K. Dutt.

ALLAHABAD UNIVERSITY.

The new University Buildings are under construction.

GOVERNMENT EDUCATIONAL NEWS.

IMPERIAL EDUCATION DEPARTMENT.

The Government of India have decided that where the actual anniversary of the birth-day of his Majesty the King Emperor, viz. the 3rd. June, falls within the summer vacation of any educational institution, a day may be added to the vacation and that in other cases the 5th June should itself be observed as a holiday and may be marked by such celebrations as may be considered desirable. They add that in the current year the day on which it is proposed to hold an Imperial Durbar at Delhi viz. December 12th, should also be recognised as a holiday in all educational institutions and that suitable celebrations should be held upon that date. This has been communicated by the Local Governments to the Director of Public Instruction who has been informed that separate orders will issue as to the nature of such celebrations.

The services of Mr. A. H. Longhurst, Superintendent, Archaeological Survey, Western Circle, are placed at the disposal of the Government of Madras from the date on which he is relieved of his duties in the Western Circle.

The Director General of India Medical Service is appointed a member of the Court of Visitors of the Indian Institute of Science in place of Director General of Education which appointment has been abolished.

BENGAL AND BURMA.

An examination in English Idiom and Pronunciation of the Teachers of High and Middle English Schools who have to teach English or other subjects through the medium of English will be held at the Office of Inspector of Schools, Midnapore on Saturday 30th October 1911. Only those candidates who have passed the Entrance or one of the

higher examinations at an Indian University are eligible to appear. Last date of sending applications 16th. October 1911.

English Teachership Examination, 1911, will be held at the Training School at Calcutta on the 27th. November 1911 and the two following days. There will be three papers of 4 hours and 100 marks each, (1) Art of Teaching, (2) Discipline, (3) Organisation. The oral and practical examination will be in actual class teaching and in notes of lessons and will carry 100 marks. Pass marks—50 percent in each of the subjects. The Director of Public Instruction, Bengal will grant Certificates to successful candidates.

All private students for Matric, 1911 are required to appear at the test examination of a Zilla School, and will have to pay a fee of Rs. 2. The test examination in all Zilla schools in the Chota Nagpur Division will be held on 14th December 1911 and following days. Applications to reach the office of the Inspector of Schools before 1st November 1911.

It is notified that a new centre for holding the Sanskrit First and Second Examinations under the auspices of the Ghananda Krinkarinath Sanskrit Samiti at Dubalhati, in the district of Rajshahi, has been sanctioned by the Board of Sanskrit Examinations from the year 1912.

The following is the programme of dates and arrangements for the public Examinations conducted by *Burma Education Department*—

Burma Exams (1) Anglo-Vernacular High School Examination 1912 to commence 11th March 1912. Application for admission must be made before 15th January 1912. (2) Examination of Technical Branch of Insein Reformatory School to be held on the 11th March. (3) Drawing Teacher's Lower Grade Certificate—30th Nov. and 1st Dec. European Schools Examination 1911—29th and 30th Nov. and 1st, 2nd,

4th and 6th December. (5) Annual and Final Examinations of Insein Government School of Engineering will begin 4th March 1912.

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The Rules for the training of Teachers in Government Schools and of Subordinate inspecting staff in E. B. & A. are :—(1) Full pay may be given, but in no case as a matter of right to a teacher or inspecting officer in Government employ deputed to a training institution, (2) Pay of the *locum tenens* will be regulated by ordinary rules of Civil Service Regulations, (3) Officers above 35 years may be exempted from the necessity of undergoing training.

The results of the Examinations of Sanskrit

Examination Result	Titles held in February 1911 are :— KAVYA : 1 in First Division, 99 in Second Division. KALAP : 30 passed of which 4 in First Division and 26 in Second Division. SUPADMA : 4, all in Second Division. PANINI : 17, of which 2 in the First Division and 15 in Second. SANKHIPHASAR : 4. MUGDHA-BODHA : 12. PRAYAG RATNAMALA : 3. SMRITI : 19. JYOTISH : 8. PURAN : 1. SANKHYA : 6. VEDANTA : 5. MIMANSA :—1, SADHARAN DARSHAN : 2, NYAYA : 10.
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Dacca Medical School Final Examination Results : Bimal Sankar Sen Gupta, Md. Abdul Khaliq, Sadat Ali Koandar and Md. Abdul Haque—all in Second Division.

Dibrugarh BerryWhite Medical School Result : Harakanta Dwara, Benoy Kumar Das and Jagat Bandhu De.

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The six special senior scholarships of Rs. 15 a month for *Mahomedans* are awarded to—
Scholarships and Prizes Shahabuddin Ahmed, Abdul Hosain Sardar, Mafizyuddin Bhuyan, Habibar Rahman, Ashrafali Khan of the Dacca College and Ashrafulla of Comilla Victoria College. The Six Govt. Scholarships of Rs. 10 a month awarded to Mafizuddin Fakir, Dacca College ; Muhammad Ismail, Dacca Jugannath College ; Aminul Haq, Mahamed Gholam Akbar,

Mahomed Yasin and Syed Ebrahimali of Rajshahi College.

The following Eastern Bengal Students have been granted *Moskin Senior Scholarships* for the year 1911. Qumaruddin Mahomed, Dacca College, Rs. 16 ; Mahomed Taheraddin, Rajshahi College, Rs. 14 ; Abdul Majid Ziaosh Shams, Gauhati College, Rs. 12 a month.

The Assam Scholarships for training in Engineering to the value of Rs. 15 per mensem tenable for two years at the Ahsanulla School of Engineering, Dacca, are awarded to—Jitaram Das, Nalini Kanta Das, and Padmeswar Barpujari.

The following candidates are awarded *Govt. Orissa Law Scholarships* as the result of a Competition and are arranged in order of merit :— Madhusudan Biswal, Arta Hari Misra, Hare Krishna Das, Hari Krishna Samanta, Rajanikanta Pattanyak, Parasuram Misra.

A *Special Scholarship* of Rs. 20/- a month is granted to Basil Evans and Arthur Evans, tenable for one year at the Goethal's Memorial School, Kurseong, subject to usual conditions of good conduct etc. A *Special Scholarship* of Rs. 5/- a month is granted to Bibi Meherjan of Hailakhandi Sub-division in Cachar District to enable her to prosecute her studies at the Agalpur Upper Primary School in that Sub division.

Maung Ba Ohn, a student in 2nd year Engineering class of Govt. School of Engineering at Insein is awarded a Maung Ohn Ghine Engineering Scholarship of Rs. 9/- a month tenable for one year. G. A. Macdonald, a student in the 1st year class of the aforesaid School is awarded a European Scholarship of Rs. 20/- per mensem tenable for two years.

Saran Das and S. C. Das are each awarded a Middle English Scholarship of Rs. 10/- a month for 3 years with effect from 15th June 1911.

Dr. Chandra's Scholarship in Materia Medica and Therapeutics.—The above Scholarship of the value of Rs. 361-8 will be awarded to the best successful candidate who will be selected at an examination to be held this year in November 1911. The examination is open to (1) all senior students of Calcutta Medical College, (2) any ex-senior student studying at any Medical College

in Europe, (3) any graduate or licenciate in medicine of whatever standing who may have received the diploma or degree in India or Europe, but who have at some time received a portion of his professional Education at the Calcutta Medical College. Applications must reach the Principal, Medical College, Calcutta before 10th. October 1911. Candidates are required to write a thesis on Pharmacology and Therapeutics of "Peirochiza" (Kutki) and submit the same to the Professor of Materia and Therapeutics by the 30th. November 1911.

Appointments etc. The L-G. of Eastern Bengal is pleased to appoint Mr. J. Vas, I. C. S. to be a member of the Provincial Text Book Committee *vice* Mr. S. C. Mukerjee I. C. S. on leave out of India.

Babu Sharat Chandra Majumdar is confirmed in his appointment as Demonstrator in Physics Patna College and in Class II of Subordinate Educational Service.

Babu Hara Chandra Majumdar, Head Clerk Krishnagar College is appointed on probation for one year to be Head Clerk Presidency College, Calcutta *vice* Babu Adhar Chandra Mukherji retired.

Maung Bo Gyi is appointed Shan Teacher on probation at the Govt. School for the sons of Shan chiefs at Taungyin.

Maintenance Grant to Colleges—for the year 1911 1912.

College	Annual Grant	Receipts from Private Sources
St. Columbas' Hazaribagh.	Rs. 12,000	{ Rs. 4,188 (Fees, Rs. 2880).
Scottish Churches' Calcutta	22,000	{ 1,27,488 (53,400).
St. Xavier's Calcutta.	5,400	{ 20,904 (15,240).
Wesleyan Mission Bankura.	3,600	{ 12,528 (6,960).
Behar National Bankipur.	4,800	{ 14,143 (8,951).
Daulatpur Khulna.	3000	{ 6,300 (3240).
L. M. S. Calcutta.	3000	{ 5,048 (1,708).

The maintenance grant for the current year have not yet been determined in the case of all the

Colleges concerned, notably Bangabasi, Midnapur and Tirhut Colleges.

MADRAS AND CEYLON.

Additional books other than those previously issued as *text-books for the Secondary School-leaving Certificate Examination 1912*:—TAMIL—Juva Bhupati by C. R. Srinivasa Aiyengar, Prithvi Rai by Namasivaya Mudaliar. TELUGU—Greek Myths Part II by C. Lakhi Nasimhaur; Apavada Tarangini by K. R. V. Krishna Rao. CANARESE—Ahalya Bai by B Venkatachari; Kanataka Ramaya Natakam by Sosab Aiyar Shastri. MALAYALAM—Kanaka Mallika by P. T. Kanan, B.A.

Teachers' Certificate Examination. Under the proceedings of the Director of Public Instruction, it is notified that in future, applications for admission to the final Examination for Teachers' Certificates should be submitted to the Circle Inspectors of schools and Inspectress of Girls' schools concerned and not to the Inspector of European and Training schools Madras.

*** Sub-Assistant Inspector's Test:** There were 40 candidates of whom only 13 passed **Results of Exams** and 30 failed to qualify. **Elementary Schools Supervisors' Test (1911):** 15 only passed and 67 failed. **Deputy Surveyors' Test:**—41 passed. **Government Technical Examinations (April 1911):** Typewriting (Elementary Grade) 23 in first division and 422 in the second division. Do, (Intermediate grade) 2 in the first division and 77 in the second division.

Mr. Richard Littlehales, Inspector of European **Appointments** and Training Schools, has has been **Leave &c.** granted combined privilege leave and furlough for 12 months and 12 days from 23rd October 1911,

Mr. J. V. Pope, M. A. Special Educational Officer Cochin has been granted privilege leave for two months and after the expiry of his leave he has been permitted to resign his appointment.

Mr. V. R. Venkataswarier, M. A., L. T. Senior

Lecturer in the Ernaculam College has been appointed to act as Principal of the same college, *vice* Mr. F. S. Davies appointed Director of Education, Cochin.

When the Text Book Committee rules were revised recently, the Head Master of the Normal School, Trivandrum was appointed *excofficio* Secretary to the Committee.

But now that the Normal School is abolished, and the Training College established, the Director of Public Instruction has recommended that the Vice-Principal of the Training College should be appointed *ex-officio* secretary of the Text Book Committee. The Government have ordered that the words "Vice-Principal of the Teacher's College Trivandrum" to be substituted for "Head Master Normal Schools for male teachers" in G. O. No. E. 807 dated 4th April 1910.

BOMBAY & THE NATIVE STATES.

The Bombay Government have decided to increase the present rates of fees Rs 2, Rs 3 and Rs 4 charged in Government schools in Bombay by eight annas all round. It has further been decided to apply the same principle to schools in the mufassil. The higher rates now sanctioned will produce a net increase in revenue from fees of about Rs 50,000 a year and Government have already set aside a sum equal to the above amount for the development of secondary education. The new scale of fees will be introduced from November 1st, 1911.

The Government of Bombay have announced that the Examination for the office of Pleader of the district and subordinate courts of the Bombay Presidency will be abolished on and from January 1913. No such examination will held after the next examination in February 1912.

Mr. Krishnaji Shrinivas Hungund Head Master Karwar High School is granted two months' privilege leave on half pay from 2nd August 1911.

H. E. the Governor in Council is pleased to appoint Mr. Ramchandra Deorad Nadkarmi to act as Head Master Karwar High School during absence on leave of Mr. Krishnaji Shrinivas Hungund.

In connection with certain questions raised by the Director of Public Instruction, the Governor

General in Council has been pleased to decide (a) that with effect from 1st. November 1911 the College of Science at Poona should confine itself to civil and mechanical Engineering only, except in respect of the workshop course, in which Electrical Engineering forms one of the Subjects taught; and that no provision should be made for teaching pure Science except so far as it is required for the engineering courses; (b) that from the same date the name of the College of Science should be altered to "College of Engineering"; (c) that the Deccan College should be purely an arts college and that when the Bombay Institute of Science is opened, no arrangements should be made for the teaching of the science courses in the Deccan College except the compulsory first years course in elementary physical science under the new regulation adopted by the University (d) that when the "Bombay Science Institute" is opened (i) provision should be made in it for the teaching of the full science courses for the B. Sc. and the M. Sc. Degrees and (ii) the teaching of Science in the Elphinstone College should be discontinued, a reduction proportionate to the amount paid on account of Science teaching above the first year's compulsory course being at the same time made from the grants-in-aid annually given to the aided Colleges in Bombay.

PUNJAB AND DEPENDENCIES

INCLUDING RAJPUTANA.

Mr. Gopal Singh Chawla, Asst. Professor, Government College Lahore is promoted from Rs

250 grade to Rs 300 grade, *vice* Lala Suraj Narayan invalided; Mr. Thomas Stephens Farmer, Offg. Superintendent of Reformatory schools at Delhi in Rs 400 grade of Provincial Educational Service is confirmed in that appointment.

Lala Chiranji Lal, Assistant Superintendent Central Training College Lahore is promoted from Rs. 250 grade to Rs. 300 grade sub *pro. tem.*

Pandit Telu Ram, Assistant Inspector of Schools Delhi Division is promoted from Rs. 200 grade sub *pro. tem* to Rs 250 grade.

Lala Hari Charn Das Dat, Assistant Inspector of Schools, Jullundur Division is promoted from Rs. 250 grade sub *pro tem.*

M, Nazar Mahomed is appointed Assistant Inspector of Schools Lahore Division.

The following amendment to the Punjab Education Code (fifth edition) has been published:—
For article 444 *substitute* the following:—"Teachers of Board Schools will be entitled, in addition to their ordinary salaries, to instruction grants at the rates laid down for girls' schools in para 100. Inspecting officers will sanction the amount that has been earned on account of instruction grants, and will authorize Deputy Commissioners to draw such amounts." For article 328 *substitute* the following:—"The award of scholarships for girls will be made by Inspecting Officers and Deputy Commissioners or Managers will be authorized to draw the amount due on account of such Scholarships."

UNITED PROVINCES, C. P. AND CENTRAL INDIA.

It has been decided to send a limited number of approved students annually for training to Punjab and Bengal Veterinary Colleges as scholarship holders with a view to their qualifying as veterinary graduates to fill appointments on subordinate staff of the Civil Veterinary Department, U. P. The next batch of students will be sent in April 1912; twelve will be sent to the

Punjab and three to Bengal. Lectures and demonstrations will be given in Urdu in Punjab College and in English in Bengal. Candidates must have passed Entrance, Matriculation, School Final, School leaving or High School Examination and must be of age between 18 to 22 years. They shall have to produce Medical certificates testifying to their physical fitness. They must be residents in U. P. for at least 3 years. The selected candidates will attend the course of college study for 3 years during which time, fees, cost of books etc. will be defrayed by Government and a stipend of Rs 10 per mensem allowed to each student. Each student must enter into an agreement to serve at least 5 years the Local Government or District Board who have sent him.

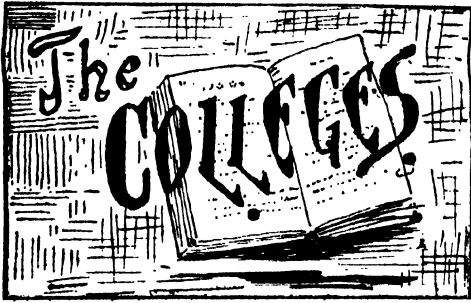
Babu Surya Bali Rai, B. A., S. C., Lecturer lower grade Training College Lucknow on Rs. 150—5—175, is confirmed in that appointment. Babu Surya Kumar Sen Gupta M. A., S. C., Assistant Master Government High School, Balia to officiate as Head Master, Pandit Shivanand Misra sub *pro tem* Head Pandit Government High School Fyzabad is granted privilege leave for 3 months from 13th September 1911.

Thakur Chhedi Singh Assistant Master Government High School, Rae Bareilly is granted furlough from 12th July 1911 to 10th February 1912.

At the Central Provinces School leaving Certificate Examination 1911, 62 candidates have passed. Mr. Keshava Balavant Bidwari, has passed the last Final B. L. Examination of the Calcutta University in the Second Division from Morris College, Nagpur.

The following ex-students of the High School, Hoshangabad are awarded the Makrai Scholarships for two years:—Ganga Prosad Pande, Laiji Kam Yadu Govinda Jog

The Director of Public Institution, U. P. has issued circulars strongly forbidding cigarette-smoking among school boys with instructions to heads of schools to punish severely those boys found smoking cigarettes and has ordered that the Inter-school tournaments are to be discontinued.



The spacious new buildings in connection with the Presidency College extension, which would accommodate the Physical and Biological Departments are now approaching completion. We can expect that, from the commencement of the next Session (July 1912), work in the laboratories will begin in full vigour. The Physics Department, in particular, which is cramped for want of space, especially after the advent of the New Regulations would certainly be comfortably placed. When complete the Presidency College might truly boast of a Physical laboratory unique of its kind in India and really deserving of the premier college of the premier University.

A fully detailed description with photos will appear in a later issue.

The College has removed to its new premises (on Harrison Road) from the beginning of the current session. The new College consists only of two commodious buildings, as it is almost impossible to get a big stretch of land in Calcutta and especially in such a locality. The laboratory and other necessary fittings are not yet complete. It is to be hoped that the authorities will spare no pains to make the College an up-to-date one.

The "Founder's Day" at La Martiniere College came off on Wednesday the 13th September, 1911. It was the seventy-sixth commemoration of the foundation of the College by General Claude

Martin. A large gathering assembled and on the whole it was a very pleasant and successful function. The proceedings began with the singing of a hymn. The distribution of prizes and certificates followed.

The President, Mr. R. P. Ashton in the course of his speech congratulated the College on its brilliant results at the Cambridge Local Examinations, and proceeded to offer a few homely words to the younger students. He said, that they were beginning to tread the road which he had long years ago trod; there were many rough places to climb, but he hoped, that there would always be the flowers called happiness to be picked up and urged the little ones not to be discouraged even if the road was steep and winded upwards to the very end. There was then a dinner, the toast was "The Memory of the Founder General Claude Martin."

The annual Re-Union of old and present students of the Calcutta Sanskrit College took place at the College premises, under the presidency of Dr. Satish Chandra Vidyabhusan the Principal of the College. The proceedings commenced with songs and recitations. The annual report was adopted and the president summed up the proceedings in a short speech. The students were then treated to a dinner.

Dr. Lucian Scherman recently visited the College and took a photograph of the professors and students as well as a phonographic record of the recitation of certain Sanskrit verses, for the Royal Ethnological Department of Munich, Germany.

A scheme for converting the present Tej Narain Jubilee College into a totally residential one is in contemplation. The Banwali Raj of Bhagalpur to whose munificence the very existence of the College is due, has again come forward to bear the whole cost of the project, which would come to ten lakhs or more. A suitable site outside the town has been selected. We hope that the scheme would be carried into action in the near future, and let us

La Martiniere
Calcutta

Calcutta
Presidency
College.

Sanskrit
College
Calcutta

Ripon College
Calcutta

T. N. J.
College
Bhagalpore

eagerly wait for the the opening of a first class totally residential College in Bengal.

It is reported that the Principal of the Patna College has recommended to the Government of the Lower Provinces for the raising of tuition fees in that College from Rs. 6 to Rs. 8.

The College has now been affiliated to the Calcutta University in Chemistry (Honours) up to the B. Sc. Standard.

The Serampore College, Bengal, has come under the Calcutta University as a second grade College from the beginning of this session. The College is affiliated in the following subjects up to the Intermediate in Arts Standard: English, Bengali Composition, Sanskrit, History, Logic and Mathematics.

His Excellency the Governor of Madras, in Council, is pleased to appoint the undermentioned gentlemen to be members of the Law College Council, Madras, and to hold office for a period of five years :—(1) The Hon'ble Mr. Justice P. R. Sundara Iyer, Judge, High Court; (2) The Hon'ble Mr P. S. Sivaswamy Iyer, C. I. E. Advocate general, Madras; (3) C. F. Napier, Esq. Government Pleader; (4) M. R. Ry S. Srinivasa Iyengar Avergal, Secretary High Court Vakils' Association.

The fifty-sixth anniversary meeting and the prize distribution of this Institution took place under the presidency of Mr. Justice W. B. Ayling. The programme began with a prayer by Rev. Mr. Hatchell. The Principal Mr. Clay, read the report drawn up by the late Principal Mr. Hoare. An interesting programme of songs and recitation was then gone through. Mr. Justice Ayling closed the proceedings with a short but most interesting and instructive speech.

In response to the recommendations of the University Commission, the Mysore Government have sanctioned the appointment of three Demonstrators, one in Mathematics, another in Geology and a third in Zoology. A grant of Rs. 10,000 has also been made for the purchase of Physical Science Apparatus. The Library of the Central College also is to have additional books, for which another grant of Rs. 5000 has been made.

We have received a photograph of the newly opened Physical Science Hall for the Central College Bangalore. As at present the full description is not to hand, we could not insert the photo in this issue.

The first celebration of the newly opened Training College and Model School Onam Day, took place under the presidency of Dewan Bahadur A. Govinda Pillay B. A., B. L., M. R. A. S. retired Judge of the High Court of Travancore, who made a very interesting speech.

The death took place at the Bowring Hospital on the 3rd September of Professor V. B. Drury of Dublin University of the staff of Bishop Cotton's High School, Bangalore. He was moved to the Bowring Hospital with enteric fever of a severe type and succumbed suddenly. He leaves a brother the Rev. J. Drury on the staff of the same school. Much regret is felt for the loss of a promising young professor and volunteer officer.

It is reported that Mr. Drew who was for sometime on the teaching staff of the Pachaiyappa' College, Madras has decided to join the resident staff of the School. Certainly, Mr. Drew will be an acquisition to the School. But the arrangement appears to be a temporary one.

From the commencement of the next session,

the name of the "College of Science", Poona will be changed to "the College of Engineering". It will be purely an Engineering College and no provision will hereafter be made for teaching pure Science except so far as it is required for the Engineering courses. The College will confine itself to civil and mechanical engineering only, except in respect of workshop course, in which Electrical Engineering forms one of the subjects taught.

The following changes have been made in the staff of the College from 1st September 1911 :—

Poona College of Science.
Mr. S. C. Bhattacharjya M. A. who was long connected with the D. A. V. College has been reappointed as the first Junior Professor of English Literature. Mr. Subodh Chandra Mukherji, M. A. (Calcutta University) has been appointed Senior Professor of English *vice* Mr. J. N. Das, resigned.

A very pleasant function came off at the Dyal Sing College on the 13th September when the teaching staff met the students after the long vacation. There have been several changes on the staff, the most notable being the appointment of Mr. Richards who is an M. A. of the Oxford University, as Professor of English Literature. Mr. Richards possesses teaching experience in England and was recommended for the post by Dr. Carpenter and Dr. P. K. Ray, Assistant Educational Adviser to the Secretary of State for India. Mr. Welinkar, the Principal welcomed the students and the professors in a felicitous speech. Rai Sahib Professor Ruchi Ram Sahni on behalf of the rustees also welcomed them and mentioned in detail the high qualifications of the new professors.

The Islamia College, Lahore reopened on Wednesday, the 6th September, 1911 after the Summer Vacation. The new Principal, Mr. Henry Martin M. A. (Oxon) may be expected to put forth his best efforts to make the institution a success, and in

the course of a few years raise the College to the present standard of the M. A. O. College, Aligarh.

Lala Sada Nand Kestri, M. A. has been appointed Professor of Mathematics in the Gordon Mission College, Rawalpindi. He had a distinguished career. He passed his B. A. Examination in the first division and stood first at the M. A. Examination 1911.

All the books forming the library of the late Justice Syed Mahmud are in the keeping of the College and have been incorporated with the English, Arabic, Persian, Urdu and Law Sections of the Lytton Library, M. A. O. College Aligarh. "The Tribune" learns with regret that the vast stores of manuscripts, old documents bearing on the history of the origin and growth of the college and the corresponding files are not in the Library at Aligarh nor do the authorities there seem to know what has become of them. We hope that the authorities will yet make strenuous efforts to recover these valuable manuscripts or definitely let the public know what fate has overtaken them.

In memory of Rev. Can. George Herbert Westcott, M. A., the late Principal of the College, (now the Bishop of Lucknow) a Library has been proposed to be erected at Cawnpore, the foundation stone of which was laid by Mr. Austin Kendal, I. C. S., District and Sessions Judge, Cawnpore.

The Rev. J. P. Haythornthwaite, M. A., Principal of St. John's College, one of the ablest and most popular educationists in India, is retiring from office after 20 years service and a farewell meeting was held in the College Hall when addresses were read out on behalf of the Old Boys Association by the District Judge, Pandit Girraj Kishore Dutt and on behalf of the College Staff by Mr. J.

I. Fanthome, Secretary of the College. The proceedings opened with an address by the Rev. H. Durrant, the new Principal, who enumerated the retiring Principal's numerous good qualities. Mr. Haythornthwaite spoke at length on the affairs of the college and reviewed with great lucidity its progress during the past 20 years. He spoke of the great affection that he entertained for the institution, in which the best 20 years of his life had been spent and declared he would always keep himself informed of its affairs and rejoice at its welfare. On behalf of Mrs. Haythornthwaite and himself he cordially thanked the old boys and college staff for the beautiful souvenirs which they had presented. These would find suitable accomodation in their home in England. Mr. Peters, the Collector, and large numbers of European and Indian gentlemen were present. An enjoyable garden party followed the reading of the addresses.

The Medical College at Lucknow, the foundation stone of which was laid on the 26th December 1905, will be opened in October next; the hospital which is a part of the scheme will, it is anticipated, be ready to receive patients by September 1913.

Both College and hospital are being built at Shah-mina, a most commanding site close to the city. The College proper consists of the following separate buildings :—

(1) The main administrative block, containing central and examination halls, library, office and professors' rooms.

(2) Anatomical block with lecture theatre and museum.

(3) Pathology and Physiological block.

(4) Medico-legal mortuary.

The hospital will consist of :—

(1) A two-storied main building.

(2) Out-patient dispensary.

(3) Cottage wards.

Additional buildings for nurses' quarters, hostels for both male and female students, 5 professors' bungalows and quarters for European and Indian assistant surgeons on duty in the hospital have been provided for.

Both electric power and gas are being laid on, and the sanitary fittings throughout are the most up-to-date obtainable. Students before admission to the College will be required to study science in a college affiliated to the Allahabad University for at least two years, and very special care has been taken to ensure that this preliminary scientific training will be in every way adequate. A special course in Biology of one year only for students entering in 1912 who have passed their B. Sc. or

Int. Sc. without taking Biology up as an elective subject is now under consideration. The actual college curriculum will extend over four if not five years, the first M. B. examination in Anatomy, Physiology and Pharmacology being held at the end of the 2nd year, the final M. B. at the end of the 4th or 5th year. The final M. B. examination will be divided into parts I and II, and a student may present himself in one part only leaving the 2nd half of the final examination to a year later. In view of the fact that the General Medical Council may not accept a four years' course for medical registration it will probably be found expedient to extend the College course to five years. The Faculty of Medicine of the Allahabad University are at present in correspondence with the General Medical Council on this point, and will shortly be in a position to make a final pronouncement upon this point

Resolutions were passed at a general meeting of the Board of Trustees, Central Hindu College, to the effect that, in view of the apprehension in the public mind that there is some danger of the Central Hindu

College being used for the dissemination of doctrines which are not in consonance with its articles of association, the Board draws the attention of the managing committee to declare the objects of the institution namely,—that moral and religious training imparted in the Central Hindu College shall be in accordance with the Hindu Shastras, and trusts to it to uphold and enforce this principle and to prevent the putting forward within the institution of any propaganda that is not in consonance with it. The meeting cordially approve of the principles stated by the President of the Central Hindu College, that such an order as that of the "Rising Sun" etc. ought not to be joined in by those who are *in statu pupillari*, and reaffirmed for general information the sense of its previous resolutions on this subject, also stated by the President in a letter, viz. that religious teaching in this institution is and shall be strictly confined to the Sanatana Dharma text-books published by this Board. In view of legal difficulties involved in the draft resolutions, the Board is of opinion that the time is not ripe for taking any action in regard to the funds and property of this institution, but the Board desires to place on record its willingness to join hands with the President and the Hon. Pandit Madan Mohan Malaviya and to co-operate with them in promoting the establishment of a Hindu University at Benares of which the Central Hindu College shall form an integral portion.



The Government of India have this year sanctioned the award of ten State technical scholarships to the following candidates for a course of training in Europe in the subjects noted against each :—

BENGAL—(1) Mr. H. D. Bennet and (2) Mr. Phani Bhushan Ray, for mechanical and electrical engineering.

EASTERN BENGAL AND ASSAM—(3) Mr. Abinash Chandra Dutta for silk weaving, dyeing and finishing.

MADRAS—(4) Mr. M. C. Sitaram for weaving and (5) Mr. H. Sakharan Rao for textile manufacture.

BOMBAY—(6) Mr. P. V. Meho, for manufacture of Tanning extracts and their use in tanning.

UNITED PROVINCES—(7) Mr. Ram Chandra Srivastava for manufacture of sugar.

CENTRAL PROVINCES—(8) Mr. M. Chulamali for manufacture of oils, fats and their products.

COORG—(9) Mr. K. M. Muttannah for mechanical engineering.

AJMER MERWARA—(10) Mr. Ram Lal for cotton spinning and weaving.

The following is a communication from Mr. J. C. Godley, Secretary to the Punjab Government, Education Department :—In

1908 two State technical Scholarships were awarded for training in the textile industry ; in 1909, one for the textile industry and one for tanning ; in 1910 one for alkali manufacture. For the current year, cotton-seed, oil milling and refining was the industry chosen, and the name of a suitable candidate was submitted to the Government of India. Information, however, was subsequently received that the Government of India were unwilling to award a scholarship

for this industry, owing to the difficulty of obtaining facilities for training ; and as selected candidates are expected to leave India by the middle of August, it was considered too late to choose another industry and invite applications. The Punjab, therefore, has to forego a technical scholarship this year ; but on the other hand the province has received five scholarships during the four years ending in 1911, or one more than the number to which it was entitled under the scheme for the foundation of such scholarships. Considerable difficulty is experienced, as in the case of this year's scholarship, in securing practical instruction in Europe in several of the most important industries for this country.

Mr. Haridas Khandelwal, a well-known author and public spirited gentleman of Jubbulpore, has made over all his properties valued at Rs. 30,000 in trust to the Association for the Advancement of Scientific and Industrial Education of Indians.

The Bombay Science Institute the foundation stone of which was laid last April by His Excellency the Governor of Bombay, owes its existence to, the munificence of three baronets of Bombay

viz., Sir Jacob Sassoon, Sir Currimbhoy Ebrahim and Sir Cowasji Jehangir.

These three gentlemen represented three different communities of Bombay, but up to this day the principal

Hindu community was in no way linked with this particular institution, though the donations of Sir Chinubhai Mohanlal in the cause of scientific education in Ahmedabad are well-known. But at last Rao Sahib Vesanji Tricumji Mulji, a leading Hindu cotton merchant of Bombay, has generously placed at the disposal of his Excellency, the Governor of Bombay, the sum of two and a quarter lakhs of rupees for the foundation of a scientific library that is to bear his name, in connection with the Institute of Science. This generous benefaction will, it is hoped enable provision to be made for the formation of an adequate scientific library in connection with the Institute, a primary essential in an institute of this character. These donations with the liberal grant of the Government

Technical
Scholarship
from the Punjab

would make up more than Rs. 30 lakhs for this Institute.

Mr. Wyndham R. Dunstan, director of the Imperial Institute, and Mr. H. Hamel Smith, the well-known writer on Life in the Tropics, have suggested the foundation of a college for the study of tropical agriculture. Ceylon has been mentioned as a suitable country for such an institution, and it is believed that money could be raised for this object as forming King Edward memories for England's tropical possessions. Should the scheme receive national, and perhaps even royal sanction, there is little doubt but that the money would be forthcoming.

Professor Dunstan rightly claims that tropical agriculture is only a branch of applied science, and that it is, therefore, something which can be taught. The fact that the private capitalist is being rapidly replaced by the investing public in all that concerns the financing of agriculture in the East is another reason for support for the memorial scheme.

The review by the Lieutenant Governor of the Civil Veterinary Department for the year 1910-11 does not indicate any expansion or growth of the Department on progressive lines. But the fault is shared equally by the College authorities as well as by the Government.

Lahore Veterinary College

The Veterinary College, Lahore, which is said to be the largest institution in Asia, is cramped for want of space and its progress is certain to be retarded until it is removed to a suitable site, where sufficient accommodation can be provided. The teaching staff also requires strengthening and a proposal to that effect is reported to be under consideration. For these blemishes, the College authorities are not responsible. But, says the *Tribune*, the report does not absolve them from their share of the blame. According to the Examiners' report, the students generally are lacking in practical knowledge. The Lieutenant Governor rightly observes that practical knowledge is after all the first essential for a veterinary practitioner and trusts that the standard of practical knowledge required for a pass will be strictly maintained. It would have been well, had His Honour

at the same time given a hint to the College staff to improve the standard of practical teaching. It is hoped that the College staff will profit by the observations made in the Government review, and maintain the College at a high level of efficiency. When this is done the hope expressed by his Honour as to valuable results in the way of original research being achieved from the proposed laboratories of the College will be realised.

THE COLLEGE OF AGRICULTURE, BENGAL.

It is perhaps not known to many that a Government Agricultural College has been opened at Sabour, a railway station on the East Indian Railway Loop Line five miles away from the Bhagalpore town. The teaching work has commenced from last November. A brief description of this institution with some of its functions may interest the readers.

The Report of the Famine Commission of 1878 led the Government to think of agricultural problems in this country and as a result institutions for performing agricultural experiments and for imparting some knowledge of scientific agriculture were started in Madras, Bombay, United and Central provinces. Bengal however did not lag much behind for in the year 1899 the Government took the question up and opened agricultural classes in connection with the Civil Engineering College, Sibpore. Graduates were mainly admitted there and the diploma was attainable after a thorough passing through a two years' course. A post or two in the Provincial Executive Service were thrown open to the successful students and hence it is quite imaginable how many of our University men crowded there for admission. The staff for this course mainly consisted of the many professors of the C. E. College; and the late lamented Mr. N. G. Mukherje, M. A., was the professor of agriculture whose, death at an early age is a serious loss to the country as well as to the Government.

Later on after full discussions of re-organisation of the provincial agricultural departments it

was realised that a college on a bigger scale than that at Sibpore is required to meet the demands of the people, and Mr. Oldham I. C. S., the then Director of Agriculture selected the present site and acquired land for the establishment of the College. In order to strengthen the staff of the would-be agricultural college at Sabour it was thought wise to depute some passed students of Sibpore to America for a higher training and for acquiring experience of Western scientific agricultural systems.

The aim and purpose of the agricultural classes at Sibpore seemed to fail because the chief attraction of the students there was the easy entrance to the executive service, and not, as it ought to have been, a knowledge of the subject. It was therefore thought proper to announce that the students of the Sabour College are not eligible for service in any department except the agricultural department and even there too no guarantee is made.

The Sibpore classes were however abolished



in the year 1908 and work commenced vigorously at Sabour. The foundation stone of this College was laid down by our late Lieutenant Governor Sir Andrew Henderson Leith Fraser.

The college was opened in November last with twenty-one students who were selected out of a large number of applicants.

The college building is a two-storied grand structure constructed by Messrs. Martin & Co., the well-known Architects of Calcutta. The long verandah and the portico projected out of it, as the plate will show, enhance the beauty and style of the building.

The ground floor contains the Chemical Section, the common Room, Principal's room and office, the spacious and well-equipped College Library,

the large and commodious Lecture theatre and the agricultural laboratory and the preparation room. Half of this floor is occupied by the chemical section.

The first floor comprises mainly Botanical, Mycological and Entomological sections and the large and well-ventilated halls for the students' practical work relating to the above subjects. Besides there are a research Laboratory and large lecture-rooms for Botany, Entomology and Physics. A dark room for Physics is also adjoined with it.

The present staff consists of the Principal who is also the Economic Botanist to the Government, the Agricultural Chemist and the Agriculturist to the Government of Bengal. Those who had been sent to America came back after a stay of two

years there and were appointed as Assistant Professors of the college.

The whole Chemical Block is in charge of the Agricultural Chemist. It contains Lecture Gallery Research Laboratory and the students' working Laboratory. Besides there are Chemists' room and office, his photographic room, the assistant professor's room and the store room.

A considerable portion of time of the Chemist is devoted to the research work on sugarcane, leguminous crops, soils and the like. Lectures on Geology and Meteorology are also delivered by him to the students. He is assisted by an Assistant Professor and a Demonstrator who are distinguished graduates of the Calcutta University.

The Students' working Laboratory is situated in a spacious hall fitted with fume chambers, gas lights and consisting of up-to-date shelves, drawers and sinks. Forty Students at a time can very comfortably work in this Laboratory. A separate 'balance room' has been attached to it for the use of the Students. The apparatus and fittings are all up-to-date with gas and water connections—the water being pumped up from a deep well in the compound fed by a perennial spring and stored in four tanks on the roof of the College, and the gas made from Petroleum in a Mansfield Engine.

The Economic Botanist occupies the whole of the first floor having charges of the sections mentioned above. The Practical Botany class for the Students is a big hall well-equipped with gas and water taps. Seats are so arranged that north light is always available for microscopical work.

A visitor is apt to wonder at the grand arrangement of the Entomological Section and the various collections including many of the rarest specimens make him quite interested in the subject.

Recently a Sericultural section has been opened and an expert has been engaged to rear the eri-silk worms. Spinning machines have been installed to produce silk out of the cocoons.

It is necessary to mention the Farm attached to the College. It lies North and South of the

building and is run by the Agriculturist assisted by a Superintendent who is an M. S. A. of the Cornell University, Ithaca. The Farm covers about 300 acres including the farm stead, workshop, cattle sheds etc. The actual area under cultivation is 150 acres. It should be remembered that this is an experimental station and hence experiments are carried on with several crops with little attention towards profits. As results of experiments green-manuring of Dhaincha (*Sesbania aculeata*) and sunhemp (*Crotalaria juncea*) has been found very successful and is practised in many instances in preference to other manures. Many improved machineries have been installed—but an eye is always kept towards the local methods and they are applied wherever necessary.

A poultry and dairy with some Montgomery cows have been started. At present the quantity of milk is barely sufficient to meet the demands of the students in the Hostel.

Even to a careless observer the Silo presents an object of attraction. It is used for preserving green fodder throughout the whole year. There is a wind-mill at the extreme South of the farm. Though it is not at present working but it is hoped it will be able to irrigate a considerable area when it will be in properly working order. The use of chain-pumps for irrigation has been found successful and they have been extensively used in the paddy area. Irish bridges in the Central road have been constructed for the automatic supply of water to the fields. The laying out of the farm has been done in an excellent, convenient way and to the requirements of different varieties of crops.

The Botanic Garden covering about 8 acres constitutes a beautiful green house containing many varieties of orchids, ferns, a big nursery and a collection of many rare plants. The lawns with flower beds present a very attractive and charming sight.

The Economic Botanist and his assistant carry on investigations of plant breeding and selection of varieties in the Garden Laboratory which is situated close to the Botanical Experimental area.

Students are to work six hours a day including both theoretical and practical. The agricultural class is generally taken in the morning. The assistant professor takes the student round the farm and shows them the operations that go on in the farm. They have to keep a diary of their observations which is submitted to the Professor in every week.

The practical work in the field is a sort of amusement. The ignorant country people laugh and wonder when they see us with *topies* on our heads and like the famous Roman Dictator holding a plough and driving the bullocks. It looks nice indeed when we all sit down in the field with sickles and scythes for cutting crops, when we all take off our coats to work at the chaff-cutters and to fill the silo up with fodder, when we assemble in the go-down for hulling maize crops. The rustics stand gazing at us as if they see in their front wonders of the world that *Babu loks* far from feeling any delicacy whatever are gladly and smilingly working with their own tools and thus encroaching upon their hereditary rights. Indeed this sort of manual labour, though often condemned by many of the aristocrats, has improved our health considerably thus showing that hard labour is congenial and wholesome to young men if held under cheerful atmosphere. 6869

Reference should now be made to the Hostel. It is a large one-storied building containing accommodation of 120 students. Separate arrangements are made for the residence of Hindus and Mohammedans with entirely separate kitchens, dining rooms spacious and well-arranged bath rooms. The courtyard in front is divided into two equal halves by a row of single-seated rooms and will, it is hoped, very soon contain two well-laid tennis lawns. There are a common room for playing indoor games and a library starting with an almirah of English and Bengali books. Several Bengali and English newspapers and periodicals on its tables afford a good opportunity of passing our leisure times pleasantly when we sit there in the evening after the day's fatigue. A sun-dial presented by the Hon'ble Mr. J. G. Cumming,

Revenue Secretary to the Government, has been located in front of the Hostel Gate. The Hostel Gong strikes according to it in the sunny weather. The water for drinking and washing purposes is supplied from a big tank placed upon four arches 15 feet high on an elevated plot of land 10 ft above the level of the ground.

A medical officer has been employed to look after the health of the students—he is also in charge of the conservancy and the drainage system. A new building for the hospital will soon be constructed.

Games for all the seasons have been arranged and Government has sanctioned considerable sum for the athletic gears. A big play ground is under construction just close to the Hostel.

The aim of the Government in establishing this institution has been the dissemination of agricultural knowledge throughout the country and they hope that students issuing out of this college will take to agriculture. If it succeeds it will be good indeed and will give real benefit to the country. But in Bengal most of the land belongs to the Zemindars and cannot be easily acquired. It is very expensive to run a farm under the improved methods, the initial cost being almost prohibitive to men of moderate means; and scientific agriculture is only experimental in India and has yet to prove its superiority over the country system. Hence it is a matter of serious consideration whether the doors of higher Government service should not be thrown open to the students of the college. Work in the Revenue Settlement, Land Acquisition can perhaps be better done by a passed agricultural student. Though service should not be regarded to be the only aim of the student here, still since every one of them cannot afford to have a farm of their own they should necessarily be made to look upon those who can do so. The Zemindars and landholders of our country are reputed to be very rich and in the best interests of their country they should come forward to help students in making a practical demonstration of the usefulness of the knowledge they acquire in the College.

I close this short note with a deep sense of my gratitude towards Mr. C. S. Taylor, B. A. (Cantab), the Agriculture Chemist to the Government of Bengal for his kindly lending me the negative of the photograph of the College building and permitting me to have it printed in this journal.

D, N. MITTER.

The College of Agriculture, Sabour, E. I. Ry.

OTHER EDUCATIONAL ADVANCES.

The full text is published here of the proposed Moslem University Act of 1911 which provides for the establishment of a University at Aligarh. It will be open to all castes and creeds while provision for instruction and examination in theology and religion will be made for Mahomedans only. The Viceroy will be ex-officio Chancellor and the supreme governing body will be the Court of Trustees to be composed of Muslims.

All degrees and courses of study will be open subject to such conditions as the regulation of the University may prescribe. The M. A. O. College, Aligarh, will be incorporated with the University and all professors and other members of the staff will hold as nearly as practicable the same offices and places in the University as they held in the College immediately before the amalgamation. The University will include the faculties of theology, arts, science, oriental learning and law. It is provided there shall be on the permanent staff at least six Europeans, who must be graduates of European Universities viz. the Provost and five professors.

A conference between the Hon'ble Mr. Butler, Education Member, Government of India, and the constitution committee of the Moslem University took place on the 23rd. September. The deputation placed before Mr. Butler the draft constitution of the University. The Raja of Mahmudabad and other notable men among whom may be mentioned, Nawab Fateh Ali Khan Kazilbash have joined the deputation.

The pamphlet, issued by the Hon'ble Pandit Madan Mohan Malaviya, embodies a clear exposition of the objects which the organisers have in view and the ideas they have placed before themselves. These are:—(1) To promote the study of the Hindu Shastras and of Sanskrit literature generally as a

means of preserving and popularising for the benefit of the Hindus in particular and of the world at large in general the best thought and culture of the Hindus and all that was good and great in the ancient civilisation of India; (2) to promote learning and research generally in arts and science in all branches; (3) to advance and diffuse such scientific, technical and professional knowledge, combined with the necessary practical training, as is best calculated to help in promoting indigenous industries and in developing the material resources of the country, and (4) to promote the building up of character in youth by making religion and ethics an integral part of education.

A very largely attended meeting was held at the Calcutta Town Hall, to support the Scheme of the Hindu University. Dr. Rash Behari Ghosh was chairman. He gave an eloquent address dwelling on the various aspects of the question. Other notable speakers were Messrs Sarada Charan Mitra, Surendra Nath Banerji, Sir Gooroodass Banerji and Pandit Madan Mohan Malaviya. Five lakhs of Rupees were raised the Maharaja of Cassimbazar, Dr. Rashbihari Ghosh, Seth Dooli Chand, Babu Moti Chand and Babu Brojendra Kishore Roy Chaudhury each subscribing one lakh.

A meeting was held at Bhagalpur to raise funds for the proposed Hindu University at Benares. Above 2½ lakhs of rupees were subscribed at the meeting, the principal donors being, Raja Kalanand Singh and his brother the Hon. Kumar Krityanand Singh of Banaili (one lakh), and Babu Sourendra Mohan Singh and his nephews who subscribed half-a lakh.

The annual prize distribution gathering of the Rajkumar College was held on the 31st August under the presidentship of Mr. E. Maconochie, the Agent to the Governor in Kathiawar. A Veda Vidyalaya is to be opened here to give instructions to Brahmin boys in Shastric literature.

The Moslem University

Deputation to Mr. Butler

The Hindu University

Rajkote Raj Kumar College

Rana Shiva Raj Singh Bahadur Taluqdar of Khajurgaon (Rai Barelli) proposes to start an Anglo-Sanskrit Pathshala at Khajurgaon to commemorate the King's visit to India.

The Maharaja of Cossimbazar has opened a Zemindar Training College at Sircar's Lane, Calcutta to impart the knowledge and practice of Zemindari affairs, in order to get students for all sorts of Zemindary work from a Moharir to a Manager.

THE GURUKUL AT HARIDWAR.

The establishment of the Gurukula at Hardwar is an attempt made by the members of the Arya Samaj to introduce the ancient system of education that was in vogue among the Hindus in the Vedic time. The Gurukul was established 9 years ago near Hardwar on the left bank of the Ganges. The site valued at about Rs. 30,000 is the gift of Shriman Munshi Aman Singhji, a philanthropic member of the Arya Samaj. The place is an ideal one in points of climate which is bracing and extremely delightful throughout the year and the natural scenery it commands with the Ganges on the one hand and the Hamalayas on the other. Lala Munshi Ram, the devoted Governor of the Gurukul, to whose untiring energy and selfless devotion the success of the Gurukul is mainly due, worked single handed in clearing the place of the jungle that grew over it and in raising sufficient funds for starting work at once. The Vidyalaya started with 4 classes and 53 students. The annual report of the Gurukul just issued gives an account of the institution and the system of education adopted there. A summary of the report will be read with interest by the general public.

Strict discipline is enforced on the students who join the Gurukul. They are required to remain Brahmcharis till they are at least 25 years of age and their parents are to give an undertaking neither to marry nor to betroth them till they reach that age. The scheme of studies includes a study of the Vedas, Shastras, English language and literature and

modern sciences and philosophy, Mathematics, Principles of Trade, the Science of Agriculture, the Science and Art of Medicine and the Science and Art of Pedagogy through the medium of English and Aryabhasha. The study of the Vedas and the ancient scriptures of the Hindus and regular physical exercise form the compulsory part of education for every student while the rest including technical and professional education, the latter for advanced students is optional. Hindu boys not less than 6 and not more than 8 years of age can get admission into the Gurukul. All students are educated and maintained free of charge. They are supplied with diet, clothing, furniture, educational necessities and medical attendance free of cost.

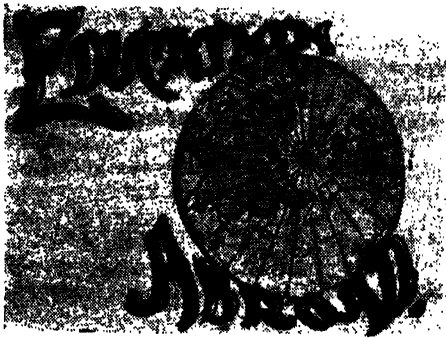
A strict control is kept over the students. They are not allowed to visit a town or village except under special circumstances such as the serious illness or death of a relation. The students going out for a walk are in variably accompanied by a teacher or Superintendent. No one is allowed to visit a student unless the person seeking to visit is his guardian or some near relation. Such visits take place under the direction of the Governor and cannot be more than one in the month. The students are allowed to correspond with their guardians not oftener than once a month. All letters are sent and received through the Governor who may read them if he so desires. The daily life of a student is well regulated and strictly disciplined. The students are required to leave their beds at 4 A.M. or 4-30 A.M. in the case of junior boys and to proceed to the river. After taking physical exercise and performing drill under the direction of their Superintendents the students bathe in the river. They then perform Sandhya and Agni Hotra and take a quantity of fresh milk. The school hours are 6-15 to 10-30 A.M. and 2-45 P.M. to 5-15 P.M. in the summer and 10 A.M. to 4 P.M. in the winter. The diet of the students is strictly vegetarian. At sunset the students again assemble together and perform the Sandhya. Before taking meals they recite Ved mantras in chorus. Special care is taken of their moral training. Their studies

are properly regulated and the choice of books judiciously directed. They are permitted to read only those books and newspapers which in the opinion of the Superintendents are suited to their mental development. The teachers are responsible not only for the sound and proper intellectual and moral training of their wards but are likewise answerable for their physical health.

There are several English and Sanskrit Clubs in the Gurukul which hold their meetings once in a week. Most of the students of the higher classes deliver lectures in Sanskrit. There is a small library attached to the Gurukul. It contains about 5,500 well-selected books, most of them are works of classical Sanskrit authors, Historical and biographical works also from a part of the library.

The course of study extends over 16 years. The Gurukul is divided into school and College departments. There are at present 14 students in the College Department and 260 students in the School Department. The number of admissions has been purposely kept down for want of space and lack of funds. Generally one class is added each year. At present there are 13 classes, 3 in the College Department and 10 in the School.

The Gurukul has recently opened an agricultural class which meets every day in the evening. The students are given practical lessons in Botany and lectures are delivered on the subject now and then.



The University of St. Andrews is celebrating the five-hundredth anniversary of its foundation.

A distinguished company of Overseas Delegates are there, and notables from India and South Africa. Over a hundred Universities are represented. The proceedings opened on Tuesday, September 12, with a reception by Lord Balfour of Burleigh, the Chancellor of the University and continued for four days. On Thursday, honorary degrees were

The anniversary of the Gurukul is an important function. Thousands of people mostly from the Punjab assemble at the premises of the institution and take part in the proceedings. On the last occasion the Educational Exhibition organised by Professor Mahesh Charan Sinha, M. Sc., and the Head-master of the Institution was a great success. The electric bells and soap cakes manufactured by the students were much appreciated. The wireless telegraphy experiments performed by Professor Sinha were much admired. The most interesting part of the programme is the Vedarambha Sanskar which is a ceremony performed for admitting new *Brahmcharis* to the Gurukul. Over Rs. 50.00 annually is collected on the occasion of the anniversary.

It is in contemplation to build a permanent building at a cost of Rs. 5 lakhs. It will include beside the class-rooms and the boarding house, a fully equipped observatory and a museum. The Governor of the Institute has made an appeal to the Hindus to raise the required amount and to fulfil one of the most pressing needs of the Gurukul. The institution is a standing monument of the public spirit and patriotism of the Arya Samajists of Northern India, and it is to be hoped that the required amount will be soon forthcoming. The Professors of the institution are a band of patriotic and self-sacrificing men who evince an active interest in the proper education of students entrusted to their charge.—*Tribune*

conferred upon nearly one hundred persons among them being Mr. Asquith, Mr. Munro Ferguson, Miss Lumsden, formerly Warden of University Hall, St. Andrews, Colonel Davis Prain, formerly of Calcutta, Mrs. Sedgewick of Newnham College and sister of Mr. Balfour. Lord Rosebery was installed as Rector. A prize of 100 guineas given in connection with this celebration for the best Essay on Scotland's debt of gratitude to her parish Schools, her grammar Schools and her Universities was awarded to Mr. Alexander Gray, M. A. of Carshalton, Surrey. The King has sent a long message saying that he is proud of his association and that of his predecessors with St. Andrews.

The Holiday course for foreigners arranged by the London University Board for the Extension of University Teaching has proved a greater success this year than in any of the preceding eight years of its existence.

The number of applications has largely exceeded the limit of 256; and no doubt measures will be concerted for an extension of the limit in future years. Seventeen different nationalities were represented as against fifteen last year. As the principal Dr. Miers said in his forcible

St. Andrews
University
quincentenary

London University
Holiday
Course for
Foreigners

inaugural address, says the *Educational Times*, there is enormous value in bringing together from so many countries persons animated by a common interest and enthusiasm; nothing could more effectively contribute to break down the barriers of language and of prejudice. In fact, there is but little barrier in matters of study: intellect is international. But the racial and social traditions are very different, and it takes much inter-course to reach a common denominator. It is extremely satisfactory that the opportunity of friendly association in common interests should have been so fully utilized. A handsome word of recognition is due to the exertions of Prof. Rippmann, who has done so much to secure such a gratifying success.

The Radium Institute was one of the most cherished schemes of King Edward and its realisation has been made possible by the magnificent generosity of Viscount Iveagh and Sir Ernest Cassell. It was opened or the 14th August 1911. The chief treasure contained in it is that one gramme of radium, to which additions have been made, bought from Austria at £15,000 by Mr. Alton, the Director of the Chemico Physical Labs of the Institute. In fact, no institution in the world possesses so large a quantity of radium. There are 12 cubicles at the institute and it will be possible to treat some 30 patients at a time. The laboratories in which research is to be carried on are furnished with the most exquisite apparatus.

The new
Radium
Institute
London

The report of the Punjab Students' Advisory Committee at Lahore, for last year shows that 128 students (72 Hindus, 33 Mahomedans and 21 Sikhs) proceeded to England. Of these 75 are studying for the bar, 20 for Engineering and 13 for medicine and the rest for various other subjects. Out of 84 students under Mr. Arnold's guardianship there are 43 Panjabi students.

Pandit GYAN CHAND RAMPAL, son of Pandit Bishen Das, Physician to H. H. the Maharaja of Kashmir, who was sent to England at the expense of the state to qualify for Civil Engineering has passed the examination of B. Sc. and A. M. I. C. E. from King's College, London with credit and has undergone a course of practical training. He is expected to return shortly.

Out of the 12 candidates that appeared at the last examination for the degree of F. Ph. (Fellow of Philosophy) before the Board of Philosophical Study London only two passed. One of them is Mr. KASHI LAHIRY of the Middle Temple. Mr. Lahiry is the first Bengalee and the 3rd Indian getting this degree.

Mr. Nand Lal Mehta who went to England in 1908 for study has passed the final B. Sc. (Engineering) examination from the Bristol University and has got the 2nd prize for his essay on the Indian Irrigation Scheme.

Pandit Prabhu Datt Shastri, M. A., M. O. L., Ph. D., B. Sc. (Oxon) arrived at Lahore by the Bombay Mail on morning of Friday, the 4th September. Two years ago he was sent to Europe as the Government of India State Scholar for Sanskrit Research. He did a satisfactory research work in the domain of Sanskrit Philology and got the degree of Doctorate in Philosophy at the Kiel University in Germany. This is an honor peculiarly his own for Kiel is one of the most conservative and exacting Universities in Europe. He has also taken the degree of B. Sc. in Mental and Moral Philosophy at the Oxford University. Dr. Prabhu Datt Shastri is the son of Pandit Ganesh Datt Shastri, Professor of Sanskrit, Oriental College, Lahore.

Messrs. Bejoy Sarkar, Noren Sen, Jotin Seth and Hiralal Roy, scholars of the National Council of Education, Bengal, who went to America for further study and joined the Harvard University, have been making excellent progress there. We are glad to note that on the result of the annual examination of the Harvard College, the University authorities have been pleased to award to each a scholarship of 150 dollars.

Pandit Hriday Nath Kunzru, a member of Servants of India Society and a son of Pandit Ajudhia Nath who was some time a member of the Legislative Council, U. P. sailed for England on 8th August to join the London School of Economics and Political Science.

Messrs. Suren Maitra and Pavitra Dutta of the Calcutta Presidency College sailed for England on the 31st and 17th of August respectively. Mr. Maitra will study at Cambridge, Physics being his subject. Mr. Dutt joins the Leeds University for studying dyeing, finishing &c.

Messrs. Krishnan Pandalai B. A., B. L., of the Quilon Bar and N. Govinda Pillay of Mavelikarai, Travancore will shortly proceed to Europe to qualify themselves for the Bar and Engineering respectively.

DR. HENRY BOLUS of Kenilworth near Cape Town, has left to the South African College his valuable herbarium and library, £20,000 (to be increased later by £7000) for upkeep and extension of both, £12,000 for scholarships, and eventually his landed property—"the largest bequest ever made to an educational institution in South Africa."

Mr. Morton P. Plant has offered £200,000 to endow the women's college to be established at

Endowments
and Benefac-
tions

New London, Conn., on condition that the institution be named the Connecticut College for Women. —Brown University has received a bequest of £17,000 from Dr. Oliver H. Arnold, of Providence. —The General Educational Board has

published a list of its latest grants to Colleges and schools, amounting in all to £126,800. —Princeton University has received £8,000 for a Lectureship in Public Affairs, and £12,000 more in various gifts. [United States]

MONASTIC EDUCATION.

BY MAHAMAHOPADHYA DR. SATIS CHANDRA VIDYABHUSANA, M. A., PH.D., PRINCIPAL,
SANSKRIT COLLEGE, CALCUTTA.

[N.B.—An extract from a long paper on "Old Indian Education" the full text of which will appear in a later issue.]

I was greatly pleased to find that the old monastic system of education still survived in Ceylon. It is the remnant of a system which has kept Buddhism alive for the last twentyfive centuries. Every body knows that the sublime teachings of Buddha as contained in the Pali literature reached Ceylon about 254 B. C. Since then these have been perpetuated mainly by oral traditions by generations of Buddhist monks called Bhikkhus. These are people who voluntarily leaving their homes and abandoning all that are near and dear to them take the vow of celibacy and poverty with the main object of acquiring true knowledge for themselves and spreading knowledge to others. Their residence is called a monastery, in Pali Sangharama or Vihara, which contains besides a bo-tree, a temple and a pagoda, a large number of cells for the accommodation of pupils. They earn their daily meal by begging unless lands yielding sufficient income are granted to their monastery by rich men or kings. Freed from all cares anxieties they pass their days in deep studies which are interrupted only occasionally by their visit to the bo-tree, temple or pagoda which they do for reviving holy associations. As a result of this system of isolated life in the monastery there has come down to our time the vast treasure of Pali literature which is so much valued by students of religion, philosophy, and history.

The famous Chinese pilgrim Hwen tsang who visited India in the 7th century A. D. mentions a story which illustrates the efficient character of the education imparted in monasteries in the olden days. It is stated that a certain Brahman was severely beating his little boy when a Buddhist Bhikkhu arrived. On inquiry it was found that the boy was being cruelly punished for not being able to commit to memory the Sanskrit rules of Panini's grammar. The Brahman was so much offended that he even offered the boy to the Bhikkhu saying that he did not like to maintain one who was a disgrace to his family. The Bhikkhu in reply told that that boy of his was Panini himself

reborn. But his words were of no effect. At last out of pity the Bhikkhu took the boy away and gave him shelter in his monastery. There he lived unmolested without being asked to read or write. After a short while, however, the boy following the examples of Bhikkhus and imitating their strict methods of living began, out of his own accord, to get up from bed very early in the morning and to earn his meal by begging, applying himself in his leisure hours to study and meditation. In a few years he completely mastered the entire system of Panini's grammar and became an expert in other branches of learning to the great delight of his parents and kinsmen.

The intellectual and moral progress of India and its adjoining countries is to a large extent due to the monastic establishments that abounded in olden times. I hope that there is none here who has not heard of the famous monastery of Nalanda in Behar. It flourished during the early centuries of the Christian era. The monastery had in its possession 200 villages bestowed upon it by kings of different generations. All expenses were carried on by the produce of these villages. In the monastery there were three hundred apartments with more than three thousand resident monks. They were very strict in observing the rules of Vinaya and were looked up to as models by all India. Learning and discussing they found the day too short, day and night they admonished each other, juniors and seniors mutually helping to perfection. Learned men from different cities came to Nalanda to acquire renown, and some persons even usurped the name of Nalanda students in order that they might be received everywhere with honour. Those who came from abroad to enter schools of discussion were first examined at the gates. The monastery had six gates which were guarded by distinguished scholars. The post of a gate-keeper was a very honourable appointment which was to be confirmed by the King himself. Persons, who are fortunate in getting through the trial at the gates, had to undergo another test as a preliminary for admission into the hall of discussion. The problems that they had to face at this stage were so very difficult that many had to withdraw. Not more than two or three out of ten succeeded in taking part in the actual debate. The very few who could distinguish themselves in it were presented with Pandita's cap and their likeness in paint were preserved on the walls.

The library of the monastery consisted of three

grand buildings each ninestoreyed high. Books copied by pupils who excelled in the art of writing were kept in good order in racks labelled with fly-leaves. The students at Nalanda were mostly monks who acquired learning not for money or other considerations but for its own sake.

Last year I had the honour of visiting several old Tibetan monasteries in Sikkim where I was struck by a similar unselfish devotion for learning. I may mention in particular the monastery at Pamiangohi which stands on a steep solitary hill facing the eternal snow of the Kangchan-jonga peak of the Himalayas surrounded on two sides by the silvery streams of the Teesta and Rungeet. The monastery several storeyed high is built on the plan of Nalanda with excellent location of the prayer hall, library room, meditation chamber etc. There I heard of Tibetan monks called Lamas freed from all family associations confine themselves in the pursuit of knowledge in the meditation chamber attached to the library room without any body knowing what do they eat or how do they live. There they master the enormous collections contained in the library, and after 40 or 50 years come out to the public with a wooden board fastened round their chest labelled as "a living encyclopedia" in which are to be found ready answers to all questions on history, philosophy and literature of India, China, or Tibet. Their learning is liable often to be undervalued as it is of very little profit to the outside world. But in reality it is not so. It is due in a large measure to the Lamas' proverbial thirst for knowledge that we have got in Tibet the two gigantic collections called the Kangyur and the Tangyur which embody Tibetan version of thousands of Buddhist and non-Buddhist works the Sanskrit originals of which are now mostly extinct in India.

I shall now make a brief reference to the educational work carried on by the Buddhists for monks outside the monastery. In ancient times they were the most powerful agents in disseminating knowledge to the masses. Their activity as missionaries was often displayed in the most inhospitable regions. As for an instance, let us think of Central Asia two thousand years ago. The vast regions round the desert of Gobi were at that time inhabited by beings who were the meeting points between men and brutes. Buddhist missionaries through Kashmir, Nepal and Assam entered upon enterprises to invite these ferocious cannibals to the humane society of Buddha. They had no funds except their begging bowls and no companions except their yellow robes. Hundreds of them must have been killed by lions, tigers, and panthers, hundreds must have succumbed to the inclemency of weather and hundreds must have died for want of food and drink. History has taken no notice of them. But the few that succeeded in actually reaching the goal worked miracles.

The whole of Mongolia and Siberia accepted Buddhism, welcomed universal brotherhood and realised the grandeur of the doctrine "Do not kill".

The activity of the Buddhist monks was displayed in another direction. Many of them were good physicians, and it was a self-imposed duty with them to walk from door to door and from one country to another for prescribing medicines. People were exceedingly pleased to receive medical advices from them as they were healers not only of the body but also of the mind. Of the itinerant physicians the name of Arya Nagarjuna stands as the foremost. His medical works have come down to our time. He is recorded in old books to have used often to leave recipes for diseases inscribed on pillars in the public streets in order that people might consult them even in his absence. The Buddhist monks were of service to men in many other ways. Even now they are the ornaments of human society maintaining as they do the highest standard of morality, unselfishness and forbearance.

I believe I have spoken enough to show that the monastic education rests on a very sound basis. We can not imagine a more quiet and sacred centre of learning than a monastery which is destitute of all temptations, and it is also impossible to find a more faithful body of custodians of ancient learning than the monks who devote their whole life to study and sacred meditations.

But I think I should not omit to mention here a charge that has been brought by some critics against monastic education, viz, that it is entirely religious in character. The secular literature, should, according to them, be quite distinct from the religious literature, the former being suited to all while the latter to a few only. In reply it may be pointed out that in ancient times almost all nations built up their literature on the basis of their religion. The Vedic literature of the Brahmans, the Prakrita literature of the Jains, the Hebrew literature of the Jews and the Zend literature of the Old Persians are all religious in their essence. Even in Mediaeval Europe the literature was to a certain extent a mere instrument for demonstrating the dogmas of the christian church. The Greeks and Romans were perhaps the only nations that founded a system of secular literature which had nothing to do with religion. Happily in the case of Pali, the charge above mentioned counts for nothing as the bulk of that literature is purely moral and historical in character. The Pali courses in the Vidyodaya College are so framed that they satisfy the varying wants of the clergy and the laity.

THE LATE MR HARINATH DE.

AN APPRECIATION.

BY HON'BLE DR. A. SUHRAWARDY, M. A., PH. D.

It was in the month of September, 1909, that three friends sat around a table and discussed art and literature. They were in the prime of life, they were members of your honourable Society, and they had caught in its intellectual atmosphere a passion for study and work. They were dreaming dreams of the future : they were trying to seek immortality, by fixing upon a work which they could bequeath to posterity, and which "posterity would not willingly let die." They said that as once before in the history of the world the combined labours of a Hindu, a Moslem, and a Christian had made the world of culture and thought acquainted with the beauties and philosophy of the Upanishads, so once more the united efforts of a Hindu, a Moslem and a Christian might give to the world a new version of that great book, in the light of modern research and scholarship. Then one of them fell into a reverie and began to ponder over the sad end in blindness and poverty of Anquetil du Perron, over the tragic death of the princely Mystic, Dara Shikoh, and the cruel fate of his pandit and what the orthodox had then said, "such is the meed of those who dare offend the gods, who dare, for aliens and in alien tongue, unlock the mysteries of the Secret of Secrets." And then with an air of sadness he added "who knows whether we shall escape the doom of our prototypes? It seems to me that the time is at hand when we shall have to lament the loss of one of our number." On the 20th of October 1909, Ernest Theodor Bloch was suddenly carried off and India was left the poorer. Harinath De then reminded me of the prophetic fulfilment of the utterance. But it was not Bloch that had been meant, and the words of a descendant of mystics were not to be fulfilled in the equivocal manner of the Oracles of Delphi : they attained their true fulfilment on the 30th. August 1911. It seems but yesterday that Harinath De read the obituary notice of his dead comrade and whispered "Phillott or yourself may soon have to perform a similar task for me." To-night is the melancholy fulfilment of his prophecy.

Harinath De was born on 12th August 1877. His father Rai Bahadur Bhuthnath De, was a distinguished pleader in the Central Provinces. Harinath De had a remarkable University career. He invariably obtained a first class in all his examinations whether in India or in Europe, and was the recipient of many medals, scholarships and prizes. He passed his Entrance and F. A. examinations from St. Xavier's College securing the Duff Scholarship for languages. He graduated in 1896 obtaining first class Honours in English and Latin. The

same year he obtained his M. A. degree in Latin and left for England in April 1897.

In November, he passed the special M.A. examination of the Calcutta University in Greek. As a result of his achievements he was awarded the Government of India State Scholarship of £200 per annum for four years as a special consideration. With its assistance he went to Cambridge where he obtained the Tripos for Classical language and also that for mediaeval English and modern languages. In 1900, Harinath De and my humble self were appointed Delegates of the Calcutta University at the Centenary of the University of Glasgow. Later he obtained the Skeat's prize and the Chancellor's Gold Medal for classical verse. While in Europe, he studied under the greatest masters at the Universities of Sorbonne, Merbourg and other great centres of learning, and acquired great fluency and mastery over almost all languages—living and dead, of Europe and Asia. In 1901 he was appointed to the Imperial Educational Service and returned to India as Professor of the Dacca College. After serving for some time as Professor of the Presidency College and Principal of the Hooghly College, in March 1907, he was appointed Librarian of the Imperial Library. He could not only converse in all the languages mentioned but also showed his proficiency by passing the severest test of examinations ; he obtained M. A. Degree of the Calcutta University in no less than five languages—Latin, Greek, Pali, Ancient and Vedic Sanskrit. He further passed the Degree of Honour examination of the Board of Examiners in Arabic, and Uriya and the High Proficiency in Sanskrit, and various other vernaculars of India securing rewards to the aggregate value of about Rs. 20,000. In the congenial surroundings and comparative quiet of the Imperial Library he had hoped to devote his time to the production of something which he could give to the world as a legacy. The Russian savant Charbatsky, while on a visit to India complemented him on his great learning and offered him a chair in the University of St. Petersburg, if he ever cared to leave India. The famous Japanese scholar and noble man Count Otani, was so much struck by his effort to restore some of the lost ancient Sanskrit writings from Chinese and Japanese sources, that he presented him with a very valuable collection of old Chinese books. It was at the instance of Harinath De, and out of the admiration and friendship that Professor Pischel bore for him, that that great Orientalist was induced to undertake the journey which cost him his life, and to come all the way from Berlin to India to honour the University of Calcutta by his lectures on Sanskrit and the Vedas. Eminently fitted, however, as Harinath De was for study and research, he, with his mild, charitable and generous disposition, was certainly not fitted to be the

head of a troublesome department. Great hopes were entertained that his deep learning would bear fruit, when suddenly a cloud began to hover over the Imperial Library whose ominous walls already bear testimony to the premature death of its first Librarian. The irregularities of his subordinates, not unknown in the days of his predecessors, were again brought to light and on the 20th January Harinath De left the Library to facilitate a thorough official enquiry. He found some consolation in the study of ancient literature for the short span of life still left to him. The enquiry was unusually protracted—the result is yet unknown—and his restless and troubled mind at last found rest on the 30th August 1911.

Happy Harinath! Lucky even in his death! An early death is a blessing from God and the privilege of the great. Better far to die young, full of hope, full of faith in the glorious visions of the future, than to live and be disillusioned, to see one's fondest desires blasted one's most cherished hopes shattered, and the golden dreams of one's youth clouded by the gathering gloom and darkness of dejection and despair. Who knows whether the survivor of those three who had hoped to immortalise themselves may not yet transmit to posterity, however imperfectly, the heritage of Harinath and Bloch; or whether he may be equally lucky, and "the unfinished window in Aladdin's palace unfinished will remain."

The following is a list of the published and unpublished works of Hari Nath De, most of them being of a fragmentary character.

1. Decipherment of a number of copper plate inscriptions in Arabic, 2. Treatise on the builders of the Taj, 3. The date of Kalidas, 4. The Travels of Ibn-Batuta, 5. Metrical translation of the Shakuntala, 6. Metrical translation of Extracts from the Maithil Poet Vidyapati, 7. Extracts from Basavadatta—translation from Sanskrit, 8. Translation in French of Bankim Chandra's "Krisnakanta's Will" (Novel), 9. Shah Alam-Nama, 10. Commentaries with text of "Journal de Monsieur Law", 11. Notes on Macaulay's Essay on Milton, 12. Notes on Palgrave's Golden Treasury, Book IV, 13. Notes on Typical Selections 1905, 14. Readings from Waverly Novels, 15. Pischel's Prakrit, 16. Some Published contributions in the Society's Journals, 17. Arabic Grammar, 18. Pali Dictionary, 19. Tibetan Dictionary, 20. Translation of Dignag's Logic from the Tibetan (part published) 21. Nagarjuna's Madhyamika Philosophy from the Chinese (part published), 22. A Translation of the works of Travel of Various Chinese Pilgrims who visited India about the time of Fa Hian, Hiuen Tsang and Itsing, 23. A Trilingual Edition of the Upanishads, 24. Several unpublished verses in French, English, Latin and Sanskrit.

He was further engaged in completing the life

works of various scholars, and not only did he himself devote all his time and energy to the pursuit of learning but he also inspired other scholars to undertake works which would prove to be valuable contributions to knowledge. The Index of the Yatimat-al-Dahr, which is being published for the Bib. Indica by our Society is an instance.

The death of the premier linguist of India, if not of Asia, almost synchronised with that of the premier Ruling Chief of India. The Nizam is dead, and a Nizam has succeeded him. The Maharaja may die and a Maharaja may succeed him. But Harinath is dead and who is there to succeed him to-day, to-morrow, or a century hence?

Let us hope that the people of India, in their admiration for knowledge and unselfishness, will do justice to the memory of the dead, and not allow his name to fall into oblivion. Let us hope that, conscious of his merits, they will endeavour to perpetuate his name as an example of what their country can produce, and as a light to guide those who struggle onwards on the dark and difficult path of the pursuit of knowledge.

THE PHILOSOPHY OF RELIGION.

BY MR C. C. SINHA, M. A.

Chapter I—Introduction.

FOUNDATION OF RELIGION

Every rational being has some philosophy or a theory of the world—has some conception of the form, origin and meaning of the world as a whole and of his own place, purpose, position and destiny as factor of the world-whole. What are we? Whence come we? Whither go we? What have we to do? What may we hope for? These are the questions which every one seeks to answer and these questions form the foundation of Religion. All people have some form of Philosophy and every form of Philosophy involves some kind of religion.

RELIGION—A PHILOSOPHY OF THE WORLD

Every religion supposes on the part of the person some idea of the person's relation to a higher personal power or powers presiding over the world. Hence an intellectual conception of the world, a theory of its constitution as governed by a higher power or powers is necessary. Thus we see that religion is an intellectual conception of the world—it is a theory of the world; but it is more than a theory, more than an intellectual conception of the world. It is both theoretical as well as practical; its theoretical part corresponds to philosophy and its practical part to theology.

ELEMENTS OF RELIGION

If religion, then, does not consist in mere intellectual conception of the world, what more does it involve? Religion is complex and it involves an intellectual element in the form of intellectual operation to frame a theory of God and of the world and to determine their relation to man; it involves an affective element in the form of reverence and love, hope and fear, gratitude and admiration, and it involves a volitional element in the form of obedience, worship and self-surrender. Thus all the three functions of mind are involved in religion. It includes the highest reason, purest emotion, the noblest conduct. Of course, some have represented religion as consisting essentially in knowing. True it is that religion, to be reasonable, must rest on knowledge of its object; but mere knowledge can never satisfy our hearts, the true life of which consists in faith and hope, reverence and love. Does it then consist in feeling only? If so, it must be either the feeling of dependence or of fear or of love. But we can not depend upon what we do not know to exist; we do not fear unless there is reason for it; and we love only what is worthy of love. Thus it is evident that feelings must be elicited by knowledge. Nor does it consist in willing alone, for, our self-surrender must be reasonable and must spring out of enlightened affections.

PHILOSOPHY AND THEOLOGY

The intellectual element is the common factor of Religion and Philosophy viz. the theory of God and the world. A true theory of the world which also involves a true theory of God is the end and object at which Philosophy aims. Thus theology is really a kind of Philosophy for it presents us with a theory of the world as a whole. But, though religion begins with an intellectual conception of the world, begins with a philosophy, it does not stop with this—it pervades the other departments of mind—feelings and volition. Religion begins with a theory which excites our feeling and the feeling in its turn excites our conduct. Thus Philosophy differs from religion in not having an emotional tone and a volitional element.

NEED OF THE PHILOSOPHY OF RELIGION

But can there be religion without Philosophy, so that, it will consist only of feeling, and activity arising out of that feeling? The answer must be in the negative. For, feeling left to itself gives rise to imagination and unrestricted imagination to vagaries of fanciful speculation. Thus religion without Philosophy is apt to be perverted and hence the need of Philosophy of Religion.

POSSIBILITY OF THE PHILOSOPHY OF RELIGION

But can there be a Philosophy of Religion? Can religion be made an object of Scientific Study? Can religion be taken out of the domain of feeling and be made an object of scientific reflection? Common sense opinion would answer by saying that religion is based on instinctive feelings and instinctive beliefs, that their ground and origin lie in a transcendental region inaccessible to human reason; that these feelings and beliefs should be accepted without question and should be acted out by faith; and that they can not be made an object of scientific study as their ground and sources are beyond the reach of human reason. Kant says that the knowledge of the metaphysical world is inaccessible to reason, but there is a field for moral and religious faith from the ethical point of view. Jacoby and Schelermacher base religion on instinctive feeling and make it independent of Philosophy. The German Theological School base it upon feeling, which manifests itself in conduct or practical life; it is independent of metaphysics which belongs to a different sphere. Hamilton excludes reason altogether from the domain of religion and makes it rest on natural feeling and revelation, Spencer holds that instinctive belief or revelation gives no knowledge of the absolute—imagination is here supreme. J. B. Balfour holds the same view as Hamilton. The opposite School, the Hegelians, hold, on the contrary, that religion is philosophy, a theory of the world, together with the feelings and emotions which rise out of it and the practical conduct as determined by it.

EMOTIONAL AND RATIONAL THEORY OF RELIGION

Thus there are two rival theories, the Emotional Theory and the Rational Theory. The Emotional Theory holds that religion is based on natural feelings and beliefs, that it realises itself in conduct, and that it has no direct dependence on reason and hence it is independent of Philosophy. The Rational Theory holds, on the other hand, that religion is based on reason, that it involves the accompanying feelings and emotions, that it involves the practical conduct which they give rise to and that it is closely connected with Philosophy.

PHILOSOPHY TRANSFORMS PRIMITIVE FORMS OF RELIGION

But religion is the product of mind and so it develops with the development of mind. Originally feeling is predominant in mind in which thought is only vague and implicit; but the thinking principle becomes more and more the master of itself; it makes the sensations and feelings more and more the materials of thought, and with the help of these materials it interprets itself and the world round and about it. Similarly in the beginning religion is a state of feeling, but it must subject itself to developing thought

and must satisfy the requirements of reason and it is philosophy of reason which seeks to transform the instinctive and immediate forms of religion into one consistent with it.

SCIENTIFIC TREATMENT OF RELIGION NECESSARY

Religion, again, must rise to the idea of the Absolute on which all depend, for, reason can not rest satisfied with the worship of natural

objects. The object of religion, which is also the object of Philosophy, is therefore, to understand the Absolute, without which we shall sink back into Fetichism. Religion, if it were to trust in mere blind feeling and instinct, must give rise to Fetichism. It is reason that has raised it above that state and without reason it would sink back again into it. Hence a scientific treatment of religion is not only possible as shown before but is essentially necessary.

To be Continued.

THE STUDY OF PHYSICAL SCIENCES.

The object of any study is to enrich life,—of physical sciences in particular is to give us well defined laws for the conduct of life.

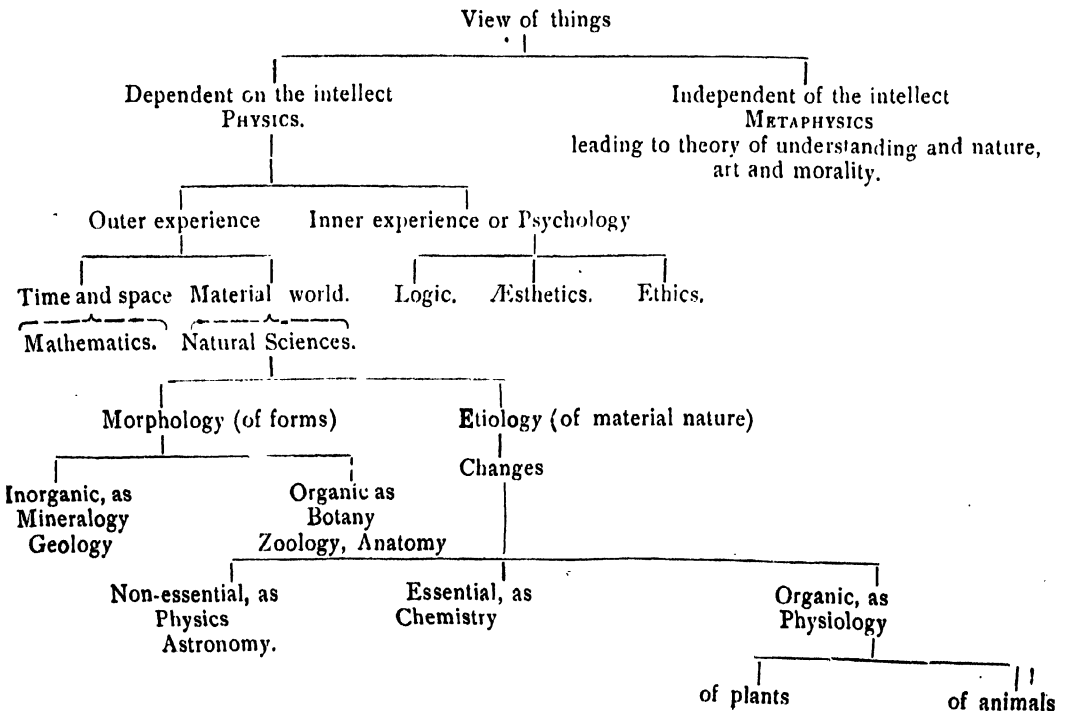
Professor Clifford is of opinion that there is only one science properly speaking and that its classification into many branches is simply a matter of convenience.

Man can observe or take a general view of things from two standpoints of view—the empirical and the transcendental.

The empirical is based on the intellect and the transcendental on generalized ideas and in part independent of the intellect.

Dr. Paul Deussen gives a classification like the following :—

Synopsis of all the general Sciences.



"Life and its conditions are in necessary harmony. This is a truism, for without the suitable conditions life could not exist. Both life and its conditions set forth the operations of inscrutable Power. We know not its origin, we know not its ends"—This we quote from the writings of Professor Tyndall.

Though we may not know the inscrutable Power lying beyond the range of all phenomena—mental and material—we can still investigate the conditions and get unalloyed pleasure from such investigation.

In the domain of different sciences in course of the last ten years many important and far reaching discoveries are made—for instance the discovery of X-rays and the radio-activity of some elements like Uranium, Thorium and Radium. These discoveries have modified the conceptions of ultimate structure of matter. The atoms and molecules of Chemists—the hard spherical particles capable of being grasped by the intellect—have given place to some complex systems like the Solar System and matter is intimately associated with electricity so much so that we can express matter in terms of electrical units and electricity in terms of material standards.

In ancient India too the idea prevalent among high thinking intellects was that matter is a created object, and here if we put down the conceptions of those intellects we might see how the progress of science in its material aspects is achieved.

In the beginning there was the Intelligence Supreme—the *Paramatman*—self existent, eternal, omnipotent and omniscient. Then by doctrine of emanation came out from that—the three *gunahs* (गुणः) with Nature (प्रकृति). Finite intelligence came next in the scale with all its limitations of time, space, mind, senses and the sensual perceptions. Then came out ether, electricity, radiant energy and per-gaseous substances, liquids and solids with complexity of properties as the progression advances.*

* This imperfect sketch is taken from Babu Tarakishor Chaudhury's recent book "Brahmarishi and Brahavidya" where the information is treated in its logical cogency in the most admirable manner and to which the reader is referred for fuller details of information.

As physical ideas derived from physical sciences are gradually advancing—students of physical sciences are getting wonderful and more wonderful facts—surpassing even the dreams of Arabian Nights.

The question now arises is there a real conflict between religion and science? We define 'science'—as true knowledge capable of being grasped by the intellect—and 'Religion' as that inborn tendency of humanity to attain highest bliss.

There is no real conflict, though humanity has passed through different phases of intellectual darkness and intolerance to the light of modern science. We might well deplore the spirit of opposition, which tends to ignore one of the mightiest impetus to action and ideal higher life.

By the implication of laws of Physics, Chemistry, Botany, Biology and Physiology many of the evils to which our frame are subject are minimised.

Science has always helped man in competing against the hostile forces of nature—but this hostility is only apparent—it is not in Nature but in our own darkness of understanding, that blindness and hostility have their places and in the sun-rise glory of scientific achievement humanity will find its final goal of progress. Let each of us try therefore to contribute his light—a feeble ray though it may be to dispel the gloom of misery, poverty, darkness, pain, sin and death.

J. N. SEN.

EUCLID.

By MR. SURESRANJAN PAL, M. A., B. L.

The name of Euclid is familiar to us all. We know him as the author of the *Elements* of Geometry. Besides his being the author of the *Elements* and of a few other works on Mathematics and Physics, some lost and some still extant, we know very little of his life and personal details. All that we are aware of him is that he was a Greek by birth and flourished at Alexandria in Egypt where he compiled his *Elements*, in the reign of Ptolemy the First; and that his greatest activity was displayed during the years 306 to 283 B. C. Euclid went to Egypt probably being invited to open a Mathematical school at

Alexandria where a University had been shortly before started by Ptolemy.

A couple of very interesting anecdotes about Euclid have come down to us to this day. Ptolemy once asked him if Geometry could be mastered by an easier method than by studying the *Elements*; and Euclid returned the answer, "There is no royal road to Geometry." James Gow of Cambridge in his "Short History of Greek Mathematics" has related a petty story. "A youth who had begun to read Geometry with Euclid, when he had learnt the first proposition, inquired, 'What do I get by learning these things?' So Euclid called his servant and said, 'Give him threepence, since he must make gain out of what he learns?'" These are all that we know of Euclid from any authentic source.

The fame of Euclid is due mainly to his *Elements* of Geometry. As the author of the *Elements* he is undoubtedly entitled to our most grateful respect. But in giving him his due we should bear in mind that he himself was not the discoverer of all the propositions and proofs to be found in the *Elements*. In fact, only a few of the propositions and proofs are due directly to him. Cajori, however, is of opinion that the proof of the "Theorem of Pythagoras," i.e., the theorem of three squares, given in the *Elements* (I. 47) is the only one which can be directly ascribed to Euclid. He got most of his materials from the earlier eminent Mathematicians. Among them the names of Thales of Miletus (640-546 B. C.) Pythagoras of Samos (580-500 B. C.), Plato of Athens (429-348 B. C.) and Eudoxus of Cnidas (408 to 355 B. C.) stand most prominent. The savant of yore to whom Geometry is most indebted is Pythagoras. It was he who raised it to the rank of a science.

However much Euclid was indebted for his materials to the earlier mathematicians there cannot be the least doubt that he was the greatest systematizer of his days. Before his time there was no treatise on the subject of Geometry. worth the name, which dealt with the subject systematically and logically. "By careful selection from the material before him," says Cajori, "and by logical arrangement of the propositions selected, he built

up, from the definitions and axioms, a proud and lofty structure." This lofty structure, viz, the *Elements* was created some two thousand years ago; and it is very remarkable that it can still be regarded as the best introduction to the study of Geometry. As a text-book the *Elements* is used even now very extensively in our schools. It may be mentioned here that the text of the *Elements* now commonly used is Theon's edition. This edition of the *Elements*, with some alterations in the original text, was brought out about 700 years after Euclid, by one Theon of Alexandria.

The *Elements* contains altogether fifteen books. The first four books are on Plane Geometry. The fifth book treats of the theory of proposition. The sixth book deals with the Geometry of similar figures, and the next three books with the theory of numbers, or with Arithmetic. The tenth book treats of the theorem of incommensurables. The three books which followed next are on Solid Geometry. The fourteenth and the fifteenth books also deal with solid Geometry. But there is some dispute as to the authorship of the last two books. Some of the authorities are of opinion that these two books were really written by Hypsicles and Damascius, and not by Euclid.

Besides the *Elements* of Geometry there are other extant works by Euclid. They are the *Data*, a course of practice in Analysis in Geometry; *Phenomena*, a work on Spherical Geometry and Astronomy; *Optics* and *Catoptrica*, two treatises on 'light'; *De-Divisionas*, a work on the division of plane figures into parts having to one another a given ratio; and *Sectio Canonis*, a treatise on musical intervals. Over and above the works just mentioned there were other works of which the authorship is ascribed to Euclid; but they are now lost. They are four in number, viz., a treatise on *Porisms*, the aim of which was to find and bring to view a thing necessarily existing with given numbers or a given construction, as, to find the centre of a circle; *Fallacies*, a work containing exercises in detection of fallacies; *Conic Sections*, in four books; and *Loca on a Surface*.

STUDENTS' SECTION

N. B. In this section will appear articles contributed by students. Competitions will be notified from time to time to encourage and promote the practice of composition among students; the prize essay will be published here.]

DYNAMO MACHINES.

We have learnt that when a conductor is moved in a magnetic or Electric field so as to cut the lines of force, a current is generated in the conductor at the cost of mechanical energy. This energy is spent to overcome the resistance experienced by a conductor as it is moved to cut the lines of force.

'Electrical Machines' or simply 'Dynos' are machines by which mechanical energy can be transformed into electric energy. The constituents are—a field of force and a conducting wire, there being a relative motion between them; i. e., in some machines the coil is rotated while the field magnet is stationary, in others the field magnet is rotated. But generally the former is the case.

The exciting magnet which produces the field is called the 'field magnet.' It is generally a horse-shoe magnet or consists of two electro-magnetic poles facing each other, the current being sent in such a direction that the two poles are dissimilar.

The coil which is rotated between or in front of the magnetic poles is called an 'armature'.

Now I shall discuss about the direction of the current in the coil or armature. The axis of rotation of the coil is horizontal and at right angles to the direction of the lines of force which are horizontal. When the coil has its plane at right angles to the lines of force, greatest no. of lines of force pass through it. When its plane is horizontal lines of force pass through it. So when it turns from the 1st to the 2nd position, the lines of force passing through it are diminished. According to Maxwell's law, about the direction of the current, a current would be produced in the wire the direction of which would change at every half a rotation of the coil. Now, if the ends of the coil are connected with two insulated cylinders fixed on the axis of rotation, and the currents are transferred to two wires by means of two springs touching the cylinders, we shall get an alternate current. Now this current has a physiological effect, but has no action on a galvanometer needle, so that it can be detected by shocks.

For practical applications such as electro-typing or driving some motor, we want a continuous current. This can be effected by an arrangement called *commutator*. It consists of two semi-cylinders fixed on a non-conducting cylinder which rotates with the axis. As the coil with the commutator rotates, an alternate current will be generated. The springs at the same time touch the two halves of the

commutator alternately. So the current comes out in the same direction.

Dynamo machines are of two kinds:—(1) Magneto-electric machines—in which the field magnet is a horse-shoe magnet. (2) Dynamo-electric machines—in which the field magnet is an electromagnet. This magnet is excited by a current from a separate dynamo or battery, or by the current produced in the dynamo itself. When soft iron is once magnetised, it retains a little of its magnetism. So there are a few lines of force in the field. As the coil is rotated, it cuts the residual lines of force, and a feeble current is produced. This current flows in the electro-magnet and excites it. Hence a few more lines of force are added in the field. In this way, the strength of the current increases more and more.

There are different kinds of Dynamo Electric Machines:—

(1) Series wound dynamo—In this kind of dynamos, the current formed by the rotation of the armature is also passed through the wire round the field magnet. The two springs touching the armature diametrically opposite to each other and in a line almost at right angles to the lines of force, which is already explained. The wire connecting one of the springs coils round the field magnet, the coiling being such that the current may flow in the opposite directions in the two branches of the magnet, so that one becomes a north pole, and the other the south. Now the end of this wire and the other spring form the two poles of the dynamo.

(2) Separate wound dynamo—Before the invention of the form just now described, the field magnet was excited by a current from an external source, such as a battery or a separate dynamo. In this case the two springs form the two poles. In this case the strength of the current produced depends upon the rate of rotation of the armature, since the field magnet has a constant strength. While in the first case, as the current strength increases, so also is the case with the field magnet. In the first case we do not require any current from an external source. When a piece of soft iron is once magnetised, it retains a little of its magnetism. There are therefore a few lines of force between the two magnetic poles at the beginning. As the armature is rotated, it cuts these lines of force, and a very feeble current is produced. This current increases the strength of the field magnet although through a very slight extent. But this process is repeated, and more and more current is produced. So we see that theoretically the strength of the current increases up to infinity. But there is a limit of magnetisation. Hence when this limit is reached, the strength of the current ceases to increase.

(3) Shunt wound dynamo.—In the series wound dynamo there is one disadvantage, viz., if there be any defect in any part of the circuit, the current will gradually

diminish. Suppose, the resistance of the wire becomes very great; hence the strength of the current is diminished. As this current is the cause of exciting the field magnet, the magnetic field will also be diminished in strength. The current will consequently further diminish. In this way if the resistance, of the external circuit be very great, the current may stop altogether. For this reason the shunt wound dynamo is invented. In this arrangement, the current of the armature is divided into two branches. One branch simply excites the field magnet, while the other one is used for external purposes.

(4) Compound wound dynamo.—In the Shunt wound dynamo, the whole of the current is not used to excite the field. Also in the case of series wound dynamo, although the whole of the current produced is used for this purpose, there is one defect as already described. But the advantages of both these systems are applied in a compound wound dynamo, viz. there is no fear of a stoppage of the current, and the whole of the current produced is used in exciting the field magnet. In this arrangement, the current produced is divided into two parts. One part is only used to excite the field magnet, while the other part is wound round the field magnet, where it is used for external purposes.

This is a short note on four kinds of dynamo electric machines. Although I have used the term armature, but it has not yet been explained. So I wish to give a short note on different kinds of armature.

Clarke's Magneto Electric Machine.—In this machine invented by Clarke the armature consists of two bobbins in which the wire is wound in the opposite directions. The bobbins are rotated by means of a spindle in front of the poles of a horse shoe magnet. The directions of the current in the wire in different positions can be determined by Maxwell's law. As the same wire is wound in the opposite directions in the two bobbins, the direction of the current will be the same in the wire. Machines of this principle are used by medical men. In this arrangement as well as in the arrangement which is described at the commencement of my essay, there is one disadvantage, viz. the current is not steady, once it increases and again it diminishes in strength, although the direction of the current can be rectified by means of a commutator arrangement. A coil is rotated in a uniform field about horizontal axis which is perpendicular to the lines of force. The rotation is uniform. It is evident that when the plane of the coil becomes parallel to the lines of force, it cuts greater number of lines per unit time than when the plane is at right angles to the lines. The E. M. F. produced depends upon the rate of cutting of lines of force. Therefore, in the former case the strength of the current becomes greater than that of the latter. But for many purposes we require a current

of constant strength. Hence an arrangement was discovered by Gramme, by which we can get a current of constant strength, and which goes by the name of

Gramme's Ring.—The principle of a Gramme's Ring is explained below. It consists of a wooden ring round which a wire is wound, the two ends being sealed together.

The ring is rotated with a uniform angular velocity in a uniform magnetic field. To determine the direction of the current, let us consider a single turn. As this coil moves from the vertical to the horizontal position less and less number of lines of force pass through it. By the application of Maxwell's law which has already been explained more than once, the directions of the current in the coil in the different positions are determined. Although the current strength near the north pole is greatest, yet, all the turns being simultaneously affected, the strength of the current will be constant.

The direction of the current will be from the upper to the lower portion of the ring through both the halves. Hence the spring touching the ring at the lowest point will be the positive pole, while the other spring at the highest point the negative pole.

Now if the wooden ring be substituted for an iron one, more lines of force will pass through it owing to the permeability of iron. But we should at the same time use insulated wires, otherwise the current will not go through the wire. But there is another difficulty, viz. the spring forming the two poles cannot touch the wire to convey the current, since the wire is insulated. Hence the invention of improved Gramme's Ring.

This ring consists of an endless iron wire wound several times. Round this soft iron are several pieces of insulated wires are wound. At the centre of this ring is a wooden bobbin fixed on the axis. On this bobbin are set as many brass pieces (insulated from one another) as the number of insulated coils. The ends of the coils are connected by means of these brass pieces, such that two ends of two successive coils are connected to one piece. Altogether, the arrangement is such that if a current is sent in the wire, it will wound in a constant direction round the core. The two springs which form the two poles, convey the current produced to the external circuit.

I have said that the springs are diametrically opposite and in a line perpendicular to the lines of force, so that no spark is produced between the spring and brass pieces. But as the armature is rotated, in order to avoid any spark, the line joining the 2 springs must be deviated from its original position through an angle known as the **ANGLE OF LEAD**.

Siemen's Armature is a very convenient form. Insulated wire is wound several times longitudinally round an iron cylinder inside two grooves cut on it. The two ends of the wire are connected to a commutator, by which the

current is rectified. In this arrangement there are two advantages—(1) it is very convenient to rotate it, (2) it can be introduced in the strongest field, so that it may cut greatest number of lines of force. But it has one disadvantage, the strength of the current is not constant. The improvement on it we find in

Drum Armature—It is not necessary to describe it though it is one of the best kind of armatures, since the principle is the same as that of a Gramme Ring. The parts of this armature are similar to those of a Gramme Ring, with the exception that instead of a ring, a cylinder is used.

All creatures, says Darwin, move in a path to progress. So in the history of mankind we see that generations after generations, all nations acquire more and more knowledge. From the simple observation that if a conductor is moved in a magnetic or electric field, so as to cut the lines of force, we can transform mechanical energy to electric energy, electric machines are constructed which are so useful for human race. The applications of electric-current for practical purposes are innumerable. Before the discovery of Electric machines, steam engines were used invariably to drive big machines. But the power of electrical energy is far greater than that of heat energy. There are other advantages of electrical machines. They are comparatively cheaper than other machines. They work silently without giving out such gases as are given out in steam engines. In steam engines, the steam must be generated by the side of the engine. But in electric machines the current is brought from miles distance. The current produced by a single generator is used in different factories. The instruments in which electric energies are spent for mechanical energies are called *Motors*. The tramcars we see every day in this town of Calcutta are driven by electric motors. If properly arranged, cars can be driven with more speed by electric motors than by steam engines. I hope that in future every machine will be worked by electric machines. Besides the advantages already mentioned there is another, that electric energy can be stored up and used when necessary, whereas in steam engines steam cannot be stored up.

The fans and incandescent lamps we find in many houses of Calcutta are worked by electricity. In electric machines, as soon as we close the circuit, the machines work simultaneously; we are not to wait for even a part of a second. Telephones and telegraphs are worked by means of electricity.

In a word, all the qualities which we so long ascribed to steam can be better applied to electricity. Like steam, it can also say, "I drive the wheel. . . .".

PROBLEMS.

[*N. B.* This part will be devoted to problems in all subjects, MATHEMATICS in particular, sent to us by readers. Solutions are invited from gentlemen taking interest in the matter. They will be published in this section.]

MATHEMATICS.

1. (L. U.) A, B, are points on a conic whose focus is S. The tangents at A and B meet the tangent at P in α and β , and AP, BP meet the directrix in U and V. Prove that each of the angles USV and $\alpha\beta$ is equal to half the angle ASB.
2. (J) ABC is a triangle, the bisectors of the angles B and C meet the two sides AC, AB at E and D respectively. Given $CD = BE$, prove that the triangle is isosceles.
3. (L. U.) Prove that if the sides BC, CA, AB of a triangle ABC are met by a straight line in the points X, Y, Z respectively, then $AY \cdot BZ \cdot CX = AZ \cdot BX \cdot CY$.
4. (E. T.) Construct a triangle, having given (1) its perimeter, in-radius, and circum-radius; or (2) the distances apart of its centroid, incentre and circumcentre.
5. (P. P. D.) If α, β, γ & δ be the eccentric angle of the four points of intersection of the ellipse and any circle, prove that $\alpha + \beta + \gamma + \delta$ is an even multiple of π radians.
6. (P. P. D.) Suppose the earth rotates about its axis at the rate of once in 24 hours, and its diameter is 8000 miles. A large pipe of diameter 100 miles is fitted through the earth terminated by two diametrically opposite points on the equator. The inside of the tube is a vacuum and the sides are perfectly elastic. Show by a graph the path of a heavy ball thrown centrally into the pipe from the surface of the earth.

SOLUTIONS

TO

UNIVERSITY QUESTIONS.

[*N. B.* This section will contain answers and solutions to difficult questions set at recent University Examinations.]

STUDENTS' DIFFICULTIES.

[*N. B.* Special difficulties, stumbling block and other knotty points, put by individual student in the form of rational questions, will find a place in this section. Answers within reasonable limits will be given. Answers are also invited from professors and teachers.]

CORRESPONDENCE.

[*N. B. Representations, grievances, suggestions, criticisms etc.—letters written on these items will be inserted in this section. The Editor does not hold himself responsible for opinions expressed in these columns.*]

THE PREVIOUS EXAMINATION.

To

THE EDITOR "THE COLLEGIAN."

Dear Sir,

Hoping your "Collegian" will find a rich patron in the student's circle, with your pleasure, it will not be out of place to spare a corner for the publication of the following lines for the benefit of those who may not have to suffer for their ignorance.

I am given to understand that there are many who wish to join the Medical College of Bombay or the Engineering College of Poona. The law of the Bombay University allows for the admission of students into those Colleges who have passed their previous examination from the said Syndicate. This previous examination corresponds to the first year of the Calcutta University, the difference being that this examination is held annually at the University, and those who pass are allowed to join the intermediate class in Science or Arts. But the Syndicate having decided upon to do away with the examination from 1913, it will be held in the Colleges at the end of every second term in September, and those who pass will be promoted to the Intermediate class.

Now, those who come from Calcutta, having passed their I. A., I. Sc., B. A., or B. Sc., examinations from that University, with a view to join the Medical or the Engineering College here, will do well to know that—

"The I. A. examination of the Calcutta University is accepted by the Syndicate as equivalent to the Previous Examination of the Bombay University, provided the student has passed with a classical subject and History; and the B. A. examination of the Calcutta University is accepted as equivalent to the Previous Examination, provided the student has passed with a classical language".

With this, I remain,

Sincerely yours
A SUFFERER.

QUERIES.

[*N. B. Letters asking for information on doubtful points and advice will be replied to here.*]

REVIEWS.

Elementary Graphs by Prof. K. P. Chottoraj, M.A. For Intermediate, B. A. and B. Sc. students. pp 59 + 60 diagrams. (Calcutta: Published by A. K. Chottoraj, 34 Ashutosh Dey's Lane, 1911.) Price 8 as.

This little volume comprises the whole subject of graphs required for the University Examinations. Assuming only a knowledge of elementary mathematics, the author has nicely worked through the different stages of the subject up to so far as cubic, logarithmic and exponential equations. A few applications of the graphic method of the study of experimental science have been given.

Lessons on Sanskrit in four parts (Science of Education series) by Prof. Benoy Kumar Sarkar M. A. of the Bengal National College. (Calcutta: Published by Chakravarty, Chatterji & Co. 63, Harrison Road). Price Rs. 3-12.

In this book the author gives birth to quite a novel method of learning Sanskrit, a method somewhat similar to Ahn's method of learning French or German. The author has endeavoured to show that Sanskrit can be very easily learnt in the self same way as other non-inflectional languages and that the student may be at once introduced to the *sentence* without any preliminary training in the rules of grammar

Intermediate Course of Practical Physics, by Prof. Rajanikanta De, B. Sc., M. A. (Calcutta: The International publishing Co., 28/1 Cornwalls Street). Price Re. 1-14. Recommended by the Calcutta University.

A very useful publication for Intermediate students of Physics. The author has elaborately dealt with the methods of Practical work expecting as little as possible of Mathematics from the students. The Book will also help students in the theoretical portion of Physics especially the chapter on Electricity. On the whole the book removes a longfelt want, providing a systematic course of Elementary Practical Physics adapted to the needs of Indian students.

SCIENCE NOTES

AND

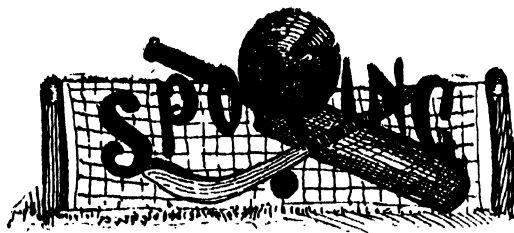
OTHER INTERESTING MATTERS.

Mental Photographs. Major Darget who has made a prolonged study of the 'V' rays which issue from the human body, has succeeded in obtaining some curious photographs by their aid. With the object of ascertaining whether it was possible to procure a photographic record of mental images he shut himself up in a dark room illuminated by a red light. He first fixed his eyes on his walking stick and then concentrated all his thought on a photographic plate in a developing bath into which he also plunged his hand. In a quarter of an hour the walking stick was reproduced on the plate, and a similar experiment with a bottle was quite as successful. Each photograph was obtained in the presence of half a dozen witnesses.

The New Comet (Keiss). Mr. Keiss of Lick Observatory, California, discovered the new comet on July 7. This is the second cometary discovery of the present year. It was sufficiently bright to be visible in an opera glass and had a short tail. Observation from several places, including Greenwich are now to hand. The orbit shows a strong resemblance to that of a small comet found by Miss Herschel in 1790, but up to this time it has not proved to be a return of the same object. Mr. Newall in No. 4517 of the *Astronomische Nachrichten* does not give the times of the observations but states that the comet was visible to the naked eye. The continuous spectrum was recorded as very faint.

Airman of the Hour. M. Vedrines, the most daring French aviator, who made a plucky effort to win the £10,000 prize for the race round Britain performed a very successful cross-channel flight. Leaving Hendon he followed the English coast by Brighton to Folkestone, striking from there across the channel for Boulogne. Then following the French coast he flew to Dieppe covering the whole distance from Dover to Dieppe (180 miles) in 165 minutes. After receiving a tremendous ovation he sped off towards Paris and reached Issis eighty minutes later, having done the whole journey of 278 miles from London to Paris in four hours' flying, an average of nearly 70 miles an hour.

Mammoth Liner A new passenger steamer for the Hamburg-America Line, to be named "Imperator" is being constructed at the Vulkan shipbuilding yard. She will eclipse all previous records for size and splendour and will be bigger than any craft yet afloat. She presents a wonderful spectacle in the course of construction. She stands 180ft. high and is nearly 90 ft in the beam and has a length of 710 ft. Her displacement will be 50,000 tons and she will contain accommodation for 5000 passengers. Her interior furnishings and decorations are planned on the most lavish scale possible, and she will in every way merit the description of a "floating palace," or, rather, a floating town.



FOOTBALL.

MADRAS. Inter-Collegiate Tournament. Governor's Cup.

The following are the results of the matches played by the different Colleges during the month of September:—(1) Presidency College beat Medical College by 3 goals to nil. (2) Christian College beat Pachaiyappa's by 1 goal to nil. (3) Engineering College drew with S. P. G. High School (1-1). (4) Medical beat

Wesley College (6-0). (5) Presidency drew with Pachaiyappa's (2-2). (6) Engineering College drew with Pachaiyappa's College (0-0). (7) Christian College beat Law College (1-0). (8) Engineering College beat Medical (1-0). (9) Pachaiyappa's drew with Wesley College (0-0). (10) Christian College drew with S. P. G. High School (0-0). (11) Law College beat Wesley College (1-0). (12) Wesley College beat Medicals (1-0). (13) Presidency drew with Pachaiyappa's (1-1). (14) Engineering College drew with S. P. G. High School (1-1).

CALCUTTA.

HINDU HARE CUP. The two school teams Hindu School and Hare School played on the Presidency College ground when the game resulted in a win for the Hindu School boys by the narrow margin of a goal to nil. Mr. W. E. Griffiths presented the cup to the skipper of the Hindu School team.

BENGABASI CUP. The Bangabasi School team beat the Armenian College (1-0) and thus succeeded in winning the trophy.

BENGAL CUP. The City Collegiate School boys became the holders on defeating Mr. Jewell's XI (1-0) in the replay of the drawn game.

Senior Rugby Cup. Final. Calcutta.

After a hard and keen struggle, the West Ridings made a brilliant record of their sixth consecutive victory by beating the United Services, the local League champions, by 11 points (1 goal and 2 tries) to nil.

GLOUCESTER (Junior Rugby) CUP: The C. F. C. (B) and the Rangers met in the replay of the final drawn game, when a fast and interesting play resulted in a win for the C. F. C. (B).

SIMLA. Durand Football Tournament Fixtures

There are 21 entries. The ties are:—2nd Royal Fusiliers and Royal Scots, West Ridings and K. O. S. B., 5th Mountain Battery and East Yorks, Royal Lancaster Regiment and Lancashire Fusiliers, Gordon Highlanders and King's Royal Rifles, Highland Light Infantry and artillery Brigade Roorkee, 13th Hussars and Black Watch, Royal Welsh Fusiliers and Simla Volunteer, Rifles King's Liverpool and Royal Irish Rifles, King's Royal Rifles and South Lancshires, North-Western Railway Volunteers and winners of the first match.

The first match between the Royal Scots and Royal Fusiliers played on the 20th September resulted in a win for the Royal Scots by 3 goals to love. The second tie between West Ridings and K. O. Scottish Borderers ended in a win for the K. O. S. B. after two days' games resulting in draw.

BOMBAY. Rovers' Cup Tournament.—

The entries number ten, which is one more than the number competing last year. The draw is as follows—**First Round:** (1) York and Lancashire Regiment vs. Dublin Fusiliers. (2) Royal North Lancshires vs. Bombay Football Club. **Second Round:** (3) and Dorsetshire Regiment vs. Bombay Gymkhana. (4) Royal Garrison Artillery vs. Royal

Warwickshire. (5) Winners of (1) *vs.* Durham Light Infantry (6) Winners of (2) *vs.* 10th Brigade R. F. A. Kirkee. *Semi Final.* Winners of (4) *vs.* Winners of (5), and Winners of (3) *vs.* Winners of (6).

The first match was not played owing to the retirement of Dublin Fusiliers who were scratched at the last moment. The tie between Bombay Football Club and Royal North Lancshires was played on the 18th September resulting in a victory for the Military team. The soldiers scored the only goal just before call of time.

In the Second Round of the above tournament the 2nd Dorsetshire Regiment had an easy victory over the Bombay Gymkhana by the big margin of seven goals to nil. On the 21st September the match bet. Royal Warwicks and R. G. A. ended in a win for the former by 3 goals to nil.

Rugby Tournament.—

The final played between West Ridings (Holders) and Leicester Regiment resulted in a victory for the Tykes by 8 points (1 goal and 1 penalty goal) to nil.

CRICKET.

MADRAS. Inter-Collegiate Cricket Tournament. Professor's Cup.

The tournament is in full swing. Games are being played every now and then. The results of the matches during September are:—(1) Medical College 153 runs, Pachaiyappa's College 82 runs. (2) Presidency 68, Teacher's College 103. (3) Wesley 183, Engineering College 57. (4) Law College 121, Teachers College 58. (5) Medical College 207 (4 wickets), Wesley 120 (7 wickets). (6) Wesley 110, Teachers 75.

BOMBAY. The Triangular Matches.—

Between Hindus, Parsees and Presidency.

The following team represent the Hindus against the Parsees in the triangular cricket contest. Messrs. C. V. Mehta (Captain), Balu, Shivram, Vithal, Oghad Shanker, I. Sempre, K. A. Date, P. Erasha, Seshachari M. D. Pai, and S. K. Divekar.

The following represent the Parsees.—Dr. M. E. Pavri (Capt.), Messrs H. F. Mulla, Bulsara, Warden, Meheromji, Watcha, S. M. Chotia, M. D. Parekh, D. K. Kapadia, D. D. Driver, F. B. Colabawalla.

The following players have been elected to represent the Presidency in the Triangular fixtures:—Major J. Greig (Capt.), Messrs Brooke, H. L. Simms, C. A. Tenant, K. E. Cooper, W. S. Hailley, Major Southey, Cap. Tillend, Messrs V. E. Purcell, Christie, and T. H. Watts.

The first of the triangular matches began on the 21st September in fine weather. The Hindus batted first and their innings closed disastrously. Bulsara dismissed Balu for 9 runs. Warden took 7 wickets for 40 runs. Parsees had scored 142 for six wickets when stumps were drawn for the day, the principal contributors being Warden (58).

Presidency *vs.* Parsees. Presidency Win.

The Englishmen beat the Parsees by a big margin. Presidency 1st Innings 225, 2nd Innings 229. The Parsees 1st innings 135, 2nd innings 179.

INDIAN CRICKET XI's English Tour.

The Indian Cricket Eleven have returned home. They landed at Bombay on the 15th September. **Congratulations from Sir George Clarke.**

His Excellency the Governor of Bombay has sent a congratulatory message to the Indian Eleven on the hard work they have accomplished. He hopes that they have had a thoroughly enjoyable visit to England and that they will retain many pleasant memories. His Excellency is glad to hear they have played good cricket and gained much valuable experience and thinks there is no reason for discouragement at the results of the tour.

HOCKEY.

Madras Inter-Collegiate Tournament. Stoke's Shield.

Side by side with the Foot ball and Cricket matches the College boys are also engaged in Hockey games. The results of the matches played for the above Tournament between the local College teams during September are:—(1) Medical College beat Pachaiyappa's College (3-0). (2) Presidency College beat Medicals (1-0). (3) Wesley College beat Engineering College (2-0). (4) Medicals beat Christians (6-0).

CUTTINGS

FROM

LEADING JOURNALS.



What reforms in education are best adapted to the progress of the nation in King George's reign? This poser was set to Sir John Gorst who was Vice-President of Council on Education for seven years (1895-1902); and his answer is published in *T. P.'s Magazine* for July. In the first place, "Ministers and officials of the Board of Education must learn that the needs of young children's bodies are more urgent than those of their minds. Half-starved scholars cannot assimilate even such 'education' as the Board provides; they must be fed before they are taught" And they must be medically inspected, and, if necessary, cured. Secondly, "the curriculum of elementary schools must be radically reformed." It must be different for the town child and for the country child; the "book school" must be turned into a "work school"; the scholar shall no longer be crammed, but shall develop his own mind; "the pedantic rules of grammar, the geography of distant lands, and the history of remote ages" shall no longer be learned by rote, but the children shall "dig and sow, chisel and hammer, cook and wash," and so forth. And thirdly, "the exploitation for sweated wages of immature boy and girl labour must be stopped. Children must have time to learn and grow. The school age must be raised, and compulsory continuation schools established—technical for the many, literary for the few of capacity." And the higher educational institutions must be accessible to all aspirants. "Qui vivra verra." But how comes it to pass that the Board of Education turns out such educational Radicals?

—*Educational Times* (August 1911).

THE COLLEGIAN.

AN ALL-INDIA JOURNAL OF UNIVERSITY & TECHNICAL EDUCATION.

PUBLISHED TWICE A MONTH.

VOL. I.

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All communications intended for the Editor should be addressed "To the Editor" and not to any member of the staff by name.

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NOTICE TO CORRESPONDENTS.

Correspondents are requested to write legibly on one side of the paper while sending in MSS. for the Press.

Communications intended for publication must be accompanied by the name and address of the writer, not necessarily for publication but only to satisfy the Editor.

Works by Professor Benoy Kumar Sarkar, M.A.

I. In English.—AIDS TO GENERAL CULTURE SERIES.—1. Economics. 2. Constitutions. 3. Ancient Europe. 4. Medieval Europe. 5. English Literature.

II. In Bengali.—The Science of Education and the Inductive Method of teaching Series : consisting of—1. Introduction. 2. History of Education in Ancient Greece. 3. The study of Language. 4. Lessons on Sanskrit in four parts. 5. Lessons in English (2 parts). Other volumes in preparation.

III. In the Press in England.—The Science of History and Hope of mankind.

IV. In Preparation.—1. Sukraniti or Sukracharyya's System of Morals, Social, Economic and Political—Edited in English with Introduction, Translation and Notes for the Sacred Books of the Hindus Series. 2. Raja-Tarangini or the Annals of Kashmir by Kalhan the poet historian, rendered into Bengali.

Hindi Translations of Prof. Sarkar's works : 1. Sahitya-Sebi—By Badri Nath Varma, B.A. 2. National Education in Ancient Greece—by the same. 3. Introduction to the Science of Education.

The Problems of Hindu Philosophy—By Charu Chandra Sinha, M.A., Professor of Philosophy City College, Calcutta. Publisher—S. C. Gupta, 9-2, Cornwallis Street, Calcutta.



THE COLLEGIAN

An All-India Journal of University
& Technical Education.

We are glad to note that a Bombay Provincial Advisory Committee has been formed by Government to give to Indian Students going to England to study at British Universities or for liberal and technical professions, advice and information as to the conditions of admission, courses of study etc. In all districts of the Presidency the Government has appointed corresponding members of committee, through whom students can obtain whatever advice or information they require.

We deeply regret to record the death of Sister Nivedita (Miss Margaret Noble) at Darjeeling on the 13th October 1911. She had an attack of bill-diarrhoea. Her loss will be deeply mourned all over the country. She was a prolific and forcible writer and her contributions to the periodical literature of Calcutta and elsewhere mainly on Indian topics were many. The best known of her works are "The Web of Indian Life", "Kali—the mother", "Glimpses of famine and Flood in Eastern Bengal", "My Master as I saw him" and "cradle tales of Hinduism." Her last work was a paper on "The Present Position of Women" read by herself at the Universal Races Congress, London.

The Nawab of Amb in the Hazara District, Punjab has just given a big donation to the projected Islamia College

Sir Robert Laidlaw on the 5th Oct. entertained at luncheon the secretaries of the National Education Fund and other distinguished visitors to the Church Congress to meet the Bishops of Calcutta and Bombay, with a view to promoting the Fund for the education of Europeans and Anglo-Indians of India.

Sir Robert Laidlaw has already contributed £50,000 to the fund.

The Bishops of Worcester, Stafford and Edinburgh were present at the luncheon.

The Bishop of Calcutta said that judging from the successful work of the past year the future of the scheme seemed assured.

* *

The Sixth Provincial Mahomedan Educational Conference of Bengal was held on the 5th and 6th of October at the Calcutta Town Hall. The Hon'ble Aftab Ahmed Khan of Aligarh presided. Most of the speakers dwelt on the proposed Moslem University. Resolutions were adopted asking the Government to raise the Calcutta Madrasa to the status of a first grade college; to appoint a Mahomedan Manager to the Syedpur Trust Estate; to start "Mianji" training schools; to exclude Arabic from the Persian Course; to grant a proportionate share of educational grant to Mahomedans; and to make special allotment for female education.

The fifth sitting of the Mahratta Educational conference will take place at Nagpur during the Christmas Holidays.

* *

Their Excellencies Sir George Clarke and Lady Clarke were present at the celebration of the Diamond Jubilee of the Poona Native General Library on the 7th of October 1911, when occasion was taken to unveil a portrait in oils of His Majesty King George the Fifth painted by Mr. S. K. Pimpalkhare. Dr. R. G. Bhandarkar, President of the Library, welcomed Their Excellencies

Poona
Native
General
Library
Diamond
Jubilee
Celebration

His Excellency the Governor in a very lengthy and able speech dwelt on the work of the Library and its usefulness which was daily increasing. The library contains 8328 books, this was considered an insufficient number for such an institution and his Excellency hoped that the special book fund which was to be started would be a success. The number of books issued during 1910 was 6000 as compared with 4165 in the previous year. His Excellency then dwelt on the influence of western education in India and upon the general usefulness of books and said "in a public library like this the choice of books is a matter of vital importance". His Excellency concluded saying "The library, the jubilee of which we have met to celebrate, can play its part in disseminating truth and scorning falsehood, in spreading the knowledge which is power not only in the material world, but in the development of the spiritual qualities without which there can no true nationhood. 'Restraint and discipline, examples of virtue and justice, these are what form the education of the world,' said Burke. Contact with lofty souls attained through the medium of books, can help us all to acquire education in this the truest sense, and to cherish those high ideals of life and conduct of which to the end of time, mankind will continue to stand in supreme need."

A vote of thanks was proposed by Sirdar Dastoor Kaikobad, High Priest of the Parsees of the Deccan, and a distribution of pan supri and flowers concluded the ceremony.

* * *

His Highness the Maharaja of Gwalior has always shown his great solicitude for the Appreciation of Commercial and industrial progress of India in general and his subjects in particular. The latest instance of his expression of the regard for Commercial Education in a practical matter is described by Bombay Papers. His Highness has always shown the greatest interest in the famous Davar's College of Commerce of Bombay, where he ordered a son

of one of the principal officials of the State to be sent to be educated in Commerce and Finance. Prof. Ball, the Inspector General of Education in Gwalior, was personally deputed to go to Bombay and leave this youngman in charge of Prof. Davar. This youngman would also work in the Finance Department of the Indian Government. We trust that his example would be followed by other Indian Princes.

* * *

A largely attended meeting was held at Amreli in connection with the opening of the Kapole Boarding Hostel. Shrimant Sampatrao Gackwar, the younger brother of His Highness the Maharaja of Baroda, had come from Baroda to perform the opening ceremony of the Hostel. This building with one large and spacious lecture Hall ten rooms of 16' by 20' and a separate kitchen with an open ground of about 9,000 square yards for cricket, tennis, etc., has been erected from the funds of one Manchhabai, a rich Kapole lady, by her trustees Sheth Ishwardas Laxmidas and Dharmdas Dulabhdas. The building will accommodate more than 60 students.

* * *

At a meeting held at the Calcutta City College under the presidency of Dr. Prankrishna Acharya an organisation was formed in Calcutta of the residents of North Bengal, principally of the Students of College and School here. The president dealt with the necessity for such an organisation from a practical point of view. He pointed out how friendly feeling amongst the people and particularly among Students from all the districts of North Bengal sojourning in Calcutta might be cultivated and how humanitarian services in helping the needy and nursing the sick could be rendered.

At the Half-yearly general meeting of this association Dr. M.M. Kumaraswamy F.R.C.S. presided. The Report for the Half-year was read and adopted and office bearers were elected. Mr.S. Vaitianathan M.R.A.S. delivered an able and instructive lecture on "Hindu-Astronomy." It is pleasing to note the progress of this Association. The number of members has doubled since the last annual meeting. The work of the Association during the past half year is quite satisfactory.

* * *

It is understood that Colonel P. J. Gordon, Surveyor, India Department, is the officer selected to attend the International Congress of Geography at Rome arranged for this month (October).

* * *

The conference was held this year at Chapra. Hon'ble Babu Brajakishore Prasad presided. After giving some general advice as to the value of education and referring to technical and industrial education the President urged that in matters of education Behar needed preferential treatment in the sense of exemption from and reduction of fees. Behar is backward in education and hence the need for preferential treatment. Referring to students and politics the President concluded as follows :—"I

quite agree with those who ask you not to mix yourself up in the active politics of the day. It is very harmful to the students. But this does not mean that you should shut your eyes to what is going on around you. Rather I would like to see you get a sound education in the principles of politics so that you may be able to play your part and play it well when the time arrives."

Several resolutions were passed the principal ones being—(1) requesting Government to open some classes in the Patna College to make it a model college, (2) condemning early marriage and advocating the formation of a league in every district to check this evil, (3) advocating education of women.

* * *

An interesting Review of the English Education: Nilgiri al Exhibition at Kaiti contributed by a Educational special correspondent appears in the Exhibition "South of India Observer" in its issue of 7th October 1911. On the opening day the Hon'ble Mr. J. H. Stone, Director of Education, in the course of his speech referred to the teachers and spoke of the dignity of their calling and complemented them on such a fine turn-out. He thought that the exhibition would prove of great benefit to teachers in enabling them to discuss their work among themselves, and in binding them together in closer ties of a common object. He expressed his gratification at seeing so large a number of teachers and visitors present.



THE PRINCE OF WALES HOSPITAL

(From one of our medical student correspondents)

The Hospital has been erected in commemoration of the visit of the Prince of Wales (His present Majesty) to Calcutta in 1905-6. The Prince of Wales made a gift of Rs. 95,000 from the funds (Rs. 1 lakh) placed at the disposal of His Royal Highness by the Maharaja Bahadur of Darbhanga.

The hospital is a purely surgical one and only clean surgical cases are admitted into it. The idea of such a hospital originated from Sir Havelock Charles formerly visiting surgeon to the Medical College Hospital and at present surgeon to His Majesty the King Emperor.

The foundation stone of the hospital was laid in 1906 by Lord Minto and the building was completed and fitted out with necessary requisites in 1910 at the total expense of more than Rs. 14,00,000. The Hospital was opened in the beginning of this year by Her Excellency Lady Hardinge. The opening ceremony was successfully carried out on the spacious lawn to the south of the building, which is now the playing ground of the civil students of the Medical College. Amongst the distinguished guests present on the occasion were—H. E. the Commander-in-Chief of India, H. H. the Lieutenant Governor of Bengal, the Chief Justice of the Calcutta High Court, Surgeon General Harris, Col. Drury &c. &c.

There are two visiting Surgeons for the hospital Lt. Col. R. Bird. C. I. E., M. D., M. S., I. M. S. and Major. E. O. Thurston. I. M. S. There are two resident House-Surgeons and two junior House Surgeons. The resident House surgeons have their furnished quarters in the hospital premise. The hospital is in charge of a senior nursing sister Miss. Bellwright who also looks after the working of the nurses. She too has her quarters in the hospital premises. There is one surgical Registrar attached to the hospital.

There are 88 beds for patients divided into 4 wards for each Surgeon—40 beds for Indian males, 20 for European males, 10 for Indian females and 10 for European females and there are 8 cabin beds. Each ward has got one dressing room furnished with convenient and necessary requisites and the patients are dressed in these rooms. The dressings are mostly done by the civil students of the Medical College. There is a nurses' waiting room and a scullery attached to each ward.

There are two operation theatres for the two surgeons, fitted with two modern operation tables and other up-to-date necessities. There are students' gallery on one side of the operation theatres, two anæsthetic rooms attached to the theatres where the patients for operation are put under anæsthetic before being put up on the operation table, and a common sterilising room for the proper sterilisation of instruments etc. before and during the operation. Strictly aseptic precautions are taken in all the operations and dressings. There are two special theatre nurses. Operations are performed duly except on Sundays, when it is done in cases of emergency.

The hospital has got a set of X-Ray apparatus and necessary fittings which is solely meant for the patients under treatment in this hospital. There is a large electric lift fitted to the hospital for the carrying of patients and even the patients' food is carried up in small electric lifts which lead up to the ward scullery. The hospital is furnished according to the latest methods. The floors are marbled throughout and the walls are to a proper height paved with China tiles. The cabins are supplied with heating apparatus for warming the rooms during cold weather. There are telephones and bells for prompt communication with different parts of the building. Hot and cold water is supplied day and night in the taps. The baths attached to the wards are also splendidly got up. The hospital has got a high pressure steriliser presented by Her Excellency Lady Hardinge. Here the dressings are sterilised.

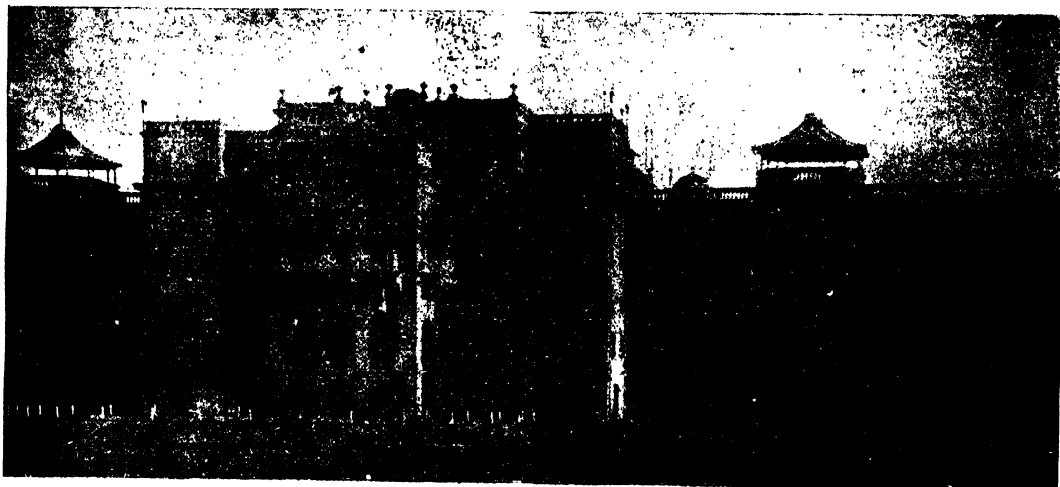


Photo taken by]

PRINCE OF WALES HOSPITAL, CALCUTTA.
SHOWING A PART OF THE FRONT.

[Our Special Artist.



Photo by]

THE NEW MEDICAL COLLEGE EXTENSION.

[Our Special Artist.

The accompanying photographs show two of the important buildings among the recent extensions of the Medical College of Bengal.

The surgical ward (Prince of Wales Hospital) is one of the most up-to-date hospitals of the kind being fitted with the latest apparatus and replete with all modern comforts.

The other building forms a part of the College accommodating the Principal's Office, Examination Hall, Common Room, lecture Theatre and Library.



CALCUTTA UNIVERSITY.

Under the Indian Universities Act, His Excellency the Chancellor of the University of Calcutta is pleased to nominate the following gentlemen to be ordinary fellows of the Calcutta University: Babu Lal Mohun Dass, Rai Krishna Chandra Banerjee Bahadur, Dr. P. C. Roy, Mr. I. H. Burkill, Mahamahopadhyay Satish Chandra Vidyabhusan, Mr. C. W. Peake, Major L. Rogers, Mr. C. Russell Mr. J. R. Barrow, Babu Bidhu Bhushan Goswami, Hon'ble P. C. Lyon, Mr. L. P. E. Pugh, Mr. Abdul Majid, Mr. W. Owston Smith.

The undermentioned Law Examinations in January 1912 will be held on the following dates: (1) Preliminary Examination in Law—29th and 30th of January 1912, (2) Intermediate Exam.—31st of January and 1st February, (3) Final Exam.—2nd and 3rd of February. Applications and fees for admission must reach the office of the Registrar on or before 29th December 1911.

The undermentioned candidates passed the M. Sc. Examination in Chemistry held in June 1911: **FIRST DIVISION** (*in order of merit*)—Sarat Chandra Jana, Gostha Bihari Paul, (University Student), Praphulla Chandra Dass Gupta (Non-Collegiate Student), Kritantanath Mitra, Haridas Mukhopadhyay, (University Student). **SECOND DIVISION** (*in order of merit*)—Jitendra Mohon Datta, Bhupendra Kishore Chaudhuri, Charu Chandra

Law Exam.
Dates

M. Sc.
Chemistry
Results

Bose, Tarakdas Ghose, Sailendra Nath Neogi, Ramesh Chandra Ray, Haridas Bandyopadhyay, (University Student).

The undermentioned candidates passed the M. A. Examination in Chemistry held in June 1911:

FIRST DIVISION (*in order of merit*)—

M. A.
Chemistry
Results

Priyadarajan Ray, Hemendra Kumar

Sen Gupta, Satiprasanna Sircar, (Non-

Collegiate Student). **SECOND DIVISION** (*in order of merit*)—Praphulla Chandra Ray (Non-Collegiate), Haralal Das Gupta, Tinkari De, Kedarnath Ghose, (University Student), Jagadis Chandra Das, Dharendra Nath Das Gupta, (Non Coll.), Umapati Bajpai, Pransankar Sen Gupta, (Univty. Std.), Durgaprasanna Das Gupta, Hem Chandra Mukhopadhyay, (Non-Coll.). **THIRD DIVISION** (*in order of merit*)—Sailendralal Mitra, Mahendra Nath Gohain, Chandra Bhushan Roy, (Non Collegiate).

On the results of the ensuing Matriculation Examination 1912, the five third grade junior scholarships attached to the Patna Division will be distributed as follows:—Patna, 2; Gaya, 1; Shahabad, 2.

MADRAS UNIVERSITY.

Under the Indian Universities Act, the Chancellor of the University of Madras is pleased to nominate Mr. Frederick Samuel Davies, B. A. as an ordinary fellow of the Madras University.

Lt. Col. Croasdaile Miller Thompson M.B., I. M. S. has resigned his ordinary fellowship of the Madras University under the Indian Universities Act 1904, Sec. 11, Sub (1) with effect from 25th August 1911.

The Syndicate places before the Senate at its meeting of 27th October 1911, the Report of the Committee of Senate appointed on October 21, 1910, to consider proposals by the Hon'ble Dewan Bahadur L. A. Govindaraghava Aiyar to amend the Regulations so as to allow of interrogatories being put to the Syndicate by members of the Senate at meetings of that body.

Interrogatories
to the Syndi-
cate

The following Post Graduate Scholarships (value Rs 20 p. m.) tenable for two years from 1st July 1911 are awarded to the students named below in the subjects noted against each: 1. A. Subbaiya (St. Joseph's College Trichinopoly)—Physics. 2. Sanjiva Rao, Kodaikal (Presidency College)—Physics. 3. Narayana Aiyar, Peruvemba (Presy.)—A. Chemistry. 4. Puranam Suri Sastri (Presy.)—A. Chemistry. 5. Mandayam J. Narasimhachari (Presy.)—Botany. 6. Kolezhi Karunakaran Nayyar (Presy.)—Zoology.

Post-graduate
Scholarships

Final Scholarships for Europeans and Eurasians 1911—Two Scholarships (one for men and another for women) of the monthly value of Rs. 30 for two years will be awarded to students of Bonafide European Parentage after passing the B. A. Examination of the Madras University.

Scholarships
to Europeans

BOMBAY UNIVERSITY.

The new Fellows named below were assigned to the faculties as under:—Hon. Col. R. W. S. Lyons, Medicine; Principal O. V. Muller, Arts; Mr. J. N. Fraser, Arts; Prof. R. Marrs, Arts; Mr. R. T. Harrison, Engineering; Major W. Glen Liston, Medicine.

Fellows

The Senate considered the desirability of amending regulation 6 of the Springer Research Scholarship as to enable a scholar to read his paper before any society interested in the subject of the research. The Rev. Dr. D. Mackichan moved that the following words be substituted for the words "for the Bombay Branch of the Royal Asiatic Society" in Regulation 6 (d) of the Springer Research Scholarship (page 607 of the Calendar for 1910-11):—"Before such Society as, in the opinion of the Syndicate, is interested in the subject matter of the paper." He said that when the regulation was first framed they had not many scientific societies in Bombay, before whom certain subjects could be profitably discussed. Mr. Mirja Ali Mahomed seconded the proposition which was carried.

Springer Research
Scholarship

The Senate considered the following letter from the Educational Adviser and forwarded by the Secretary to Government, Educational Department:—
State Scholars "Considerable difficulty has been experienced in gaining admission to Oxford and Cambridge for the Government of India scholars, which has been increased by the fact that information about them has not been received till late in the year. In order to facilitate the allocation of scholars, it would be a great convenience, if immediately on their selection, information could be sent home by cable, giving names, subject of study, and the University which it is proposed they should join. I beg to suggest that the authorities in India be asked to send this information by cable accordingly."

Dr. Mackichan moved (i) that in regulation 3 of the Government of India Scholarship (page 556 of the Calendar for 1910-11) the words "Thursday following the third Tuesday in February" be substituted for the words "3rd Monday in June," (ii) that the following clause be added at the end of Regulation 4 of the same Scholarship:—" (c) statements showing the general course of study which they propose to follow, and the University they intend to join."

Dr. Mackichan said that the difficulties described in the letter were such as would be recognised as real. It appeared that the names of those proceeding to Oxford or Cambridge with the subject they wished to appear in ought to be in hand before April. That was much earlier than was possible now. If the dates were changed, the Syndicate would be able to nominate candidates at the March meeting. In this matter, they had been following a precedent in the scholarship awarded by the late Sir Mangaldas Nathooabhai. He hoped that the Senate would unanimously pass this proposition.

Pao Bahadur Godbole seconded the proposition, which was carried.

LATIN TEXT BOOKS—In the list of Text Books prescribed for Latin for the Previous Examination of 1912 (page 765 of the University Calendar for 1910-11) substitute the following for
Alterations in
text-books
"2. Ovid—Metamorphosis. B. 1-4 (White's ed.)":—"Ovid—Metamorphoses (Bk. XIV.)". In the list of Text Books prescribed in Latin (Necessary) for the B. A. Examinations for the years 1913 and 1914 (pages 766 and 767 of University Calendar for 1910-11) substitute the following for "2. Cicero—De Oratore, B. II":—"2. Cicero—Pro Sestio."

PUNJAB UNIVERSITY.

In the Proficiency in Sanskrit (*Prajna*) Examination 1911, 10 passed in the first division,

Sanskrit Exam. Results 49 in the second division, 20 in the third division.

In the High Proficiency in Sanskrit (*Visharada*) Examination, 2 passed in the first division, 12 in the second division, 16 in the third division.

In the *Shastri* Examination, 3 passed in the second division and 11 in the third.

The following successful candidates in the 1911 Examinations have been awarded scholarships by the Punjab University :—

Scholarships INTERMEDIATE ARTS : Ram Chandra, D. A. V. College, Lahore, Government Scholarship of Rs. 16 per mensem. Ram Chand, Sri Protap College, Srinagar, Govt. Scholarship of Rs. 16 per mensem. Ghulam Rasul Shauq, Islamia College, Lahore, Govt. Scholarship of Rs. 16 per mensem. Narain Das Mehta, Forman Christian College, Lahore, University Scholarship of Rs. 16 per mensem. Madan Gopal Bhatia, D. A. V. College, Lahore, Univty. Scholarship of Rs. 16 per mensem. Raghu Nath Rai, D. A. V. College, Lahore, University Scholarship of Rs. 16 per mensem. Milkhi Ram, D. A. V. College, Lahore, University Scholarship of Rs. 16 per mensem. Kanhya Lal Khanna, Government College, Lahore, Prince Albert Victor Patiala Scholarship of Rs. 12 per mensem. Rameshdwar Das, Forman Christian College, Do. Rs. 12. Lakshmana, D. A. V. College Lahore, Aitchison Ram Rattan Sanskrit Scholarship of Rs. 16 per mensem, provided he takes up Sanskrit as one of his subjects in the B. A. Examination. Fazal Hahi, St. Stephen's College, Delhi, Victoria Scholarship of Rs. 10 per mensem. Sardar Muhammad Rajput, Government College, Lahore Victoria Scholarship of Rs. 10 per mensem. Nur Ahmad Qureshi, Government College, Lahore, Victoria Scholarship of Rs. 10 per mensem. Md. Siddiq, F. C. College, Rs. 10. Sukhdeo Singh, Mohindra College, Patiala, Zamindari Scholarship of Rs. 10 per mensem. Anokh Singh, Khalsa College, Amritsar, Zamindari Scholarship of Rs. 10 per mensem.

INTERMEDIATE SCIENCE : Lal Chand Khanna, Government College, Lahore, University Scholarship of Rs. 16 per mensem.

B. A. EXAMINATION : Chiranji Lal, Forman Christian College, Lahore, Fuller Exhibition of

Rs. 30-10-0 per mensem. Zahoor-ud Din Naqshbandy, Forman Christian College, Lahore, University Scholarship of Rs. 16 per mensem for pure Mathematics. Asa Nath Kumar, D. A. V. College, Lahore, University Scholarship of Rs. 16 per mensem for *Applied* Mathematics. Gulwant Rai, D. A. V. College, Lahore, Government Scholarship of Rs. 25 per mensem for standing first in English. Faiz Muhammad Khan, Islamia College, Lahore, University Scholarship of Rs. 16 per mensem for Arabic. Ghulam Ahmad Khan, Forman Christian College, Lahore, University Scholarship of Rs. 16 per mensem for standing first in Persian. Ram Richpal Singh, St. Stephen's College, Delhi, University Scholarship of Rs. 16 per mensem for standing first in Philosophy. Bawa Harkrishan Singh, Forman Christian College, Lahore, University Scholarship of Rs. 16 per mensem for standing first in History. Vireswar Bhattacharya, Government College, Lahore, University Scholarship of Rs. 16 per mensem for standing first in Chemistry. Barkat Ali, Government College, University Scholarship of Rs. 16 per mensem for standing first in Physics. Paramanand Vidyarthi, D. A. V. College, Lahore, Aitchison Ram Rattan Sanskrit Scholarship of Rs. 25 per mensem, provided he studies Sanskrit in an affiliated College with a view to appear in the M. A. Examination. A. N. Chopra, D. A. V. College, Lahore, Prince Albert Victor Patiala Scholarship of Rs. 20 per mensem. Jhanda Singh Ghalibia, Khalsa College, Amritsar, Prince Albert Victor-Patiala Scholarship of Rs. 20 per mensem. Mohammad Ali Ansar, Government College, Lahore, Victoria Scholarship of Rs. 14 per mensem. Nizam-ud-Din, Islamia College, Lahore, Victoria Scholarship of Rs. 14 per mensem. Ishwar Singh, Khalsa College, Amritsar, Zaminpari Scholarship of Rs. 14 per mensem.

B. SC. EXAMINATION : Mahomed Barkat Ali, Gordon Mission College Rawalpindi, University Scholarship of Rs. 25 per mensem for standing first.

The following candidates while passing the Intermediate Examination of 1911 STOOD FIRST in the subjects shown against their names :—

Lakshmana, D. A. V. College, Lahore, Sanskrit. Ghulam Rasul Shauq, Islamia College, Lahore, Arabic. Vera Marley, Private Student, Simla District, Latin. Amolak Ram Raghava, St. Stephen's College, Delhi, Persian. A. M. Dusart, Private Student, Lahore District, French. Eileen O'Neill, Private Student, Simla District, English. Hukam Chand Malik, D. A. V. College.

maths. Tara Chand Vazir, Sri Pratap College, Srinagar, History. Safdar Husain, Forman Christian College, Lahore, Philosophy. Gandu Ram *alias* Satya Anand Dhir, Government College, Lahore, Physics and Chemistry. Sukh Dial Chadha, Prince of Wales College, Jammu, Geology. Nur Ahmad Qureshi, Government College, Lahore, Biology.

The following Candidates while passing the B. A. Examination of 1911, STOOD FIRST in the subjects noted against their names :—

Paramananda Vidyarthi, D. A.-V. College, Lahore, Sanskrit. Zafarulla Khan, Government College, Lahore, Arabic. Ghulam Ahmad Khan, Forman Christian College, Lahore, Persian. Gulwant Rai, D. A.-V. College, Lahore, English. Asa Nand Kumar, D. A.-V. College, Lahore, *Applied Mathematics*. A. N. Chopra, D. A. V. College, and Zahoor-ud-Din Naqshbandy, Forman Christian College, Lahore, *Pure Mathematics*. Barkat Ali, Government College, Lahore, Physics. Vireswara Bhattacharya, Government College, Lahore, Chemistry. Bawa Harkrishan Singh, Forman Christian College, Lahore, History. Bawa Harkrishan Singh, Forman Christian College, Political Economy. Ram Richpal Singh, St. Stephen's College, Delhi, Philosophy.

ALLAHABAD UNIVERSITY.

His Honour the Chancellor of the Allahabad University is pleased to nominate Mr. H. M. Bull M. A. (Cantab), Inspector General of Education Gwalior State, to be an ordinary Fellow of the University.

A Convocation for conferring Degrees on Graduates in Arts, Science and Law of 1911, will be held on the 11th November next. Only those graduates

Notice of Convocation 1911

shall receive their degrees at Convocation who have given prior notice, with particulars of College, Roll No., to the Registrar, of their intention to be present. Such notice to reach the Registrar before the 4th November 1911. Successful candidates for degrees who are present at convocation and who have not their own gowns, will have the use of their gowns *gratis*. Candidates must be present at the Muir Central College Allahabad by 1 P. M. on the day of Convocation to receive their gowns and instructions for presentation to the Vice-Chancellor; otherwise they will not be admitted to the Convocation

Candidates receiving their degrees in absence shall be each charged Rs. 10.

Mulla and Fazil Examinations will be held on the 20th November 1911, and the following days at 10 A.M.

in the Muir Central College, Allahabad.

Mulla and Fazil Exams

The fee for the Mulla Examination is Rs. 5 and that for the Fazil Exam. is Rs. 15. Fees should reach the office of

the Principal, M. C. College by the end of October 1911.



IMPERIAL EDUCATION DEPARTMENT.

Mr J. A. Chapman, Principal, Government Commercial Institute, is appointed Librarian of the Imperial Library, Calcutta.

Appointment

BENGAL AND BURMA.

Dr. A. du Pre Denning, Superintendent of Industries and Inspector of Technical and Industrial Institutions, Bengal is allowed combined leave for a period of one year from 9th October 1911.

Appointments, Promotions, etc.

Mr. John Richard Cunningham Assistant Director of Public Instruction Bengal is allowed special leave from 9th October 1911 to 11th January 1912.

Mr. E. L. Preston Inspector of Schools Patna Divn. on leave is appointed to be Assistant Director of Public Instruction Bengal from 9th October 1911.

Babu Bidhu Bhusan Datta is confirmed in Class VIII of the Provincial Education Service as Professor of Chemistry in the Krishnagar College.

Babu Ragho Prosad B. L. is appointed to be a lecturer in the Patna Law College with effect from the 18th July 1911 vice Maulavi Muhammad Manzar deceased.

Babu Baladebram Jha, additional Inspector of Schools Bhagalpur Division is allowed leave on medical certificate for two months in extension.

Babu Bijoy K. Basu is appointed to the Class VIII of the Provincial Education Service as Head Master of the Dacca Collegiate School.

Dr. M. Musharraful Hukh P.H.D. is appointed on Probation to be Professor of Arabic and Persian Dacca College in Class VII of the Provincial Education service.

Mr. Bawa Kartar Sing is appointed to Class VII of the Provincial Education Service as Professor in Dacca College.

Babu Surendra Nath Dasgupta is appointed Professor of Sanskrit, Chittagong College in Class VIII of the Provincial Education Service.

Mr. W. G. Wedderspoon took over charge of the Office of the Inspector of Normal Schools and European Education Burma, after return from leave from Mr. G. F. Munro who reverted to his post of Assistant Inspector.

The following rules are prescribed for the conferring of the Oriental Academic titles upon students of the Sanskrit College, Calcutta :—

I. Certificates conferring the title of Sastri, and bearing the joint signature of the Director of Public Instruction, Bengal, and of the Principal, Sanskrit College, Calcutta, will be issued to students of the Sanskrit College, Calcutta, who, as such, pass in the First Division the M. A. Examination of the Calcutta University in Sanskrit, provided that they have previously completed at the said College a course of studies extending over a period of not less than six years, during which they passed with credit the Lower Grade Senior and the Higher Grade Senior Scholarship Examinations of the Sanskrit College, Calcutta.

II. Certificates conferring the title of Vidyaratna, and bearing the joint signature of the Director of Public Instruction, Bengal, and of the Principal, Sanskrit College, Calcutta, will be issued to students of the Sanskrit College, Calcutta, who, as such, pass in the Second or Third Division the M. A. Examination of the Calcutta University in Sanskrit provided that they have previously completed at the said College a course of studies extending over a period of not less than six years, during which they passed with credit the Lower Grade Senior and the Higher Grade Senior Scholarship Examinations of the Sanskrit College, Calcutta.

III. Other appropriate titles, such, for example, as Vidyalkar, Vidyavagisa, Vidyavidhi, Vidyavinode, etc., will be conferred by the Principal, Sanskrit College, Calcutta, in consultation with the Professors of that College, on such students of the said College, as pass the Junior or Senior Scholarship Examinations of the College with credit, but do not satisfy the examiners at the M. A. Examination of the Calcutta University in Sanskrit.

The Lieutenant-Governor is pleased to sanction the appointment of a committee to advise on the selection of drawing books for use in schools and on other matters touching on art. The following gentlemen are the members : (1) Mr. Percy Brown, President ; (2) Mr. W. E. Griffiths, David Hare Training College ; (3) Mr. P. Mukerji ; (4) Miss Brock, Inspector of Schools ; (5) Babu Gaganendra Nath Tagore.

The following students are granted Law-Scholarships of Rs. 10 each for two years at the Dacca Law College with effect from May, 1, 1911 :—Debendra Chandra Hazra, Azizar Rahman, Muhammad Azimuddin.

The following scholarships are awarded on the results of the Intermediate Examinations 1911 :—**MOHAMMAD SENIOR SCHOLARSHIPS** : Mohammad Abdus Samad (Rs. 14), Presidency College ; Syed Nausher Ali (Rs. 12), Hindu Academy Daulatpur.

SYED KAZI REZA HUSSAIN SCHOLARSHIP : Mohammad Hussain (Rs. 11), Patna College.

DARBHANGA RAJ SCHOLARSHIPS : Mahammad Yakub and Abdul Hakim (Rs. 10 each), Presidency College.

GOVERNMENT SPECIAL SCHOLARSHIPS : S. Abdulla (Rs. 10) Presidency College ; Abdur Rashid (Rs. 10), City College ; Nabinowaz Khan (Rs. 10) Presy. ; Abdul Aziz (Rs. 10), Ripon ; Khaja Mahammad Jalaluddin (Rs. 7), Presy. ; Wazahat Hossein (Rs. 7), St. Xavier's ; Moazem Hossain Biswas (Rs. 7), Presy. ; Syed Izhar Hossein (Rs. 7), Patna College.

The Assam Junior Scholarship of Rs 10 a month granted by the D. P. I. Eastern Bengal and Assam to a Lushai youth Thanga is cancelled.

The undermentioned Assam student is granted a scholarship of Rs. 15 per mensem from June 1, 1911 for two years at the Ashanulla School of Engineering Dacca : Kailas Chandra Das.

A second collegiate scholarship of Rs 30 p. m. for two years at the Medical College Madras is awarded to H. Rishworth from 1st April 1911. (*Burma.*)

Examinations for office of Pleader (Lower Burma) or for the office of Advocate (Upper Burma) of the first second and third grades will be held at Rangoon on the 6th May 1912 and following days. Applications to reach the Registrar Education Syndicate, Burma not later than 15th March 1912.

In every book submitted for approval for use in schools and also in the application forwarding the book, the name of the author (and not a pseudonym) should be stated on the cover page or title page or the application.

Text-Book
Committee
Bengal, New
Rules

MADRAS AND CEYLON.

Mr. Philip Pipon Braithwaite, Inspector of Schools Eighth Circle is granted combined leave (privilege leave + furlough) for one year and six months from 2nd January 1912.

An examination of school management and the Art of Teaching for teachers in European Schools will be held in Madras and Bangalore in December 1911. A Preliminary Examination for Teachers' Certificate—under Madras Educational Rules, Ch. XI, Fifth Ed.—to be held in December 1911. The fees for the examinations are Secondary Rs. 5, Primary Re 1.

Final Examination for Hospital Assistants :—
Hospital Asst. A. Gopal Krishnan and K. Lakshmana
Exam (Rayapuram Medical School.)

Stipends at the Teachers' College, Saidapet :—The ordinary rate of provincial stipend in the Secondary Department is Rs. 10 per mensem special Rates subject to the following maxima may also be sanctioned : Europeans and Eurasians—Rs. 30, Muhammedans—Rs 12, Panchamas—Rs. 12, Candidates passing F. A.—Rs. 12.

BOMBAY AND THE NATIVE STATES.

Miss S. F. Pegge, Lady Superintendent, Rajkot
Resignation Barton Female Training College has tendered the resignation of her office.

Mr. Sitaram Damodar Ovalekar, late Deputy Collector and a resident of Thana, has offered to Government, a sum of Rs. 4,000 to found a Scholarship. scholarship of Rs. 10 in his name to be given to a student from the Byramji Jijibhoy High School Thana, who passes with the highest number of marks at the Matriculation Examination and joins an arts college with the view of passing the B.A. examination, the balance of the income being utilized in giving some prizes annually in the same high school. Government have accepted the offer and have asked the Director of Public Instruction to convey the acknowledgments of the Governor in Council to Mr. Ovalekar for his donation.

The Edalji Dinshaw Scholarship, tenable for one year, of the monthly value of Rs. 21, is open to Parsi Boys from the Virbaiji School prosecuting studies in the Narayan Jagannath High School, Karachi

PUNJAB AND DEPENDENCIES.

INCLUDING RAJPUTANA.

Results of the First Examination in Civil Engineering :—114 students passed.
Examination Results Clerical and Commercial Examinations 1911—Results : First Division—2, Second Division—18, Third Division—11.

UNITED PROVINCES.

C. P. AND CENTRAL INDIA.

Dr. E. G. Hili, Professor Muir Central College Allahabad is to hold charge of the office of Principal vice Mr. Jennings granted furlough.

Appointment etc. Major R. A. Cunningham R.A.M.C., M.B. to officiate as professor of Muir Central College in addition to his duties during the absence on leave of Dr. Imms.

Pundit Jwala Ram Jha M. A. to be a temporary professor in the Muir Central College in the Provincial Education Service with effect from 15th July.

Miss J. A. Mc. Reddie M. A. on return from leave to resume charge of her appointment as Inspectress of Girls' Schools VI Circle, Allahabad.

Miss G. M. Reid, B. A. L. T., Offg. Inspectress of Girls' Schools VI Circle to revert to Inspectress of Girls' Schools II Circle, Meerut.

Mrs J. C. Butcher officiating in the II Circle to officiate as Head Mistress Lucknow Girls' Normal School, during the leave of Miss Harris.

Babu Dakshina Ranjan Bhattacharjee B. sc. is confirmed in his appointment in the Provincial Education Service.

Mr. R. M. Beadon, Inspector of Schools, C. P., has been granted by his Majesty's Secretary of State for India leave on medical certificate for six months in extension of the combined leave granted to him by order No. 373 dated 22-2-11 of the Central Provinces.

From the income of the Morris Memorial Fellowship Fund (Rs. 21000, interest $3\frac{1}{2}$ p. c. per annum) a fellowship called the Morris Memorial Fellowship is instituted. The Director of Public Instruction C. P. shall be the administrator. The fellowship shall be open to natives or *bona fide* residents of C. P. and Berar who have received the whole of their University Education in one of the Government or aided Colleges in these Provinces. Candidates must be M. A.'s or M. Sc.'s but under exceptionally special cases this condition may not be enforced. The value of the fellowship shall be Rs. 60 per mensem payable quarterly in arrears at first for two years. Conditions: (a) The fellow should follow no trade or profession nor prosecute any other study except his special subject, (b) he shall prosecute his studies in a college in the C. P. approved by the Director and shall report through the Principal at the end of each six months his progress.

The Chief Commissioner, C. P. desires to acknowledge the liberality shown by the late Managing Committee of the Patwardhan High School Nagpur in giving a sum of Rs 2400 to found the "Bhargava Rao Scholarship Fund."

The following candidates are declared to have passed the C. P. School leaving Certificate Examination for 1911 in addition to those already passed: Jamna Prasad Kayasth, Devi Prasad Shrivastava--C. M. S. High School, Jubbulpore.



AND SCHOOLS.

The Bengal Colleges closed during the last week of September for the Puja Vacation and reopens on or about the 24th of October.

His Honour the Lieutenant Governor of Bengal presided at the music and dramatic entertainment given by the St. Joseph's College, Darjeeling on the 2nd October. The College sports took place on the 16th of October.

The Edward George School at Madhupur, has been affiliated to the Calcutta University. On the Committee of Management we have the Hon'ble Mr. Justice Ashutosh Mukherjee, Sir Gurudas Banerjee, Hon'ble Maharaja Sir Prodyot Kumar Tagore, the Hon'ble Maulavi Shamsul Huda and others; the Secretaries are Tikait Krishna Prasad Singh Ghatwall of Pathrole and the Hon'ble Babu Deva Prasad Sarbadhikary. The school began with less than a hundred students and seven boarders, a few months ago, and the number of students is now nearly 200. A large number of people from malaria stricken districts go to Madhupur about this time of the year for change but are compelled to return in view of the re-opening of the schools. To meet their requirements the school has been established. At the head of the school is a veteran educationist, Babu Kherode Chandra Roy Chaudhuri who has been a prominent member of the Government Educational Service. Fifty bighas of land are being acquired. Eighteen lakhs of bricks have been made, a well has been sunk and public subscriptions as well as Government grant are being

invited, Mrs. R. Mitter who has agreed to build a hostel at a cost of Rs. 30,000 and a Library for Rs. 10,000 in memory of her late husband Mr. R. Mitter, a well known Calcutta Barrister has gone to Madhupur to look after the building arrangements and the school which ought to have its career of usefulness assured.

The Annual Report on the working of the Madras Medical College has now been published together with the remarks of the Surgeon-General and the Director of Public Instruction, and the Government order thereon. The most important feature of the report is the reiterated demand made by the Principal of the College and supported by Surgeon-General for increased accommodation. It is satisfactory to learn that a large grant has been made by the Government for extensions and improvements to the Medical College and the General Hospital, and that the needs of the College in regard to accommodation are likely to be fairly well met from this grant. Although the number of students on the rolls was smaller than in the preceding year, it was larger than in the year previous to 1909-1910, and it may, therefore, be said that the steady increase shown since 1906-1907 has been maintained. The number of female students attending the College was as high as thirty, and it is satisfactory to learn that they all did well. The percentage of passes, however, for all University examinations, though better than in the last year, was, with that exception, the worst since 1906-1907. The number of failures in Surgery in the M. B. and C. M. examination is engaging the attention of the College Council, and it is to be hoped that some remedy will be found for this weakness in an important subject.

The new session of the Teachers' College begins in February 1912 and applications for admission are invited by the Acting Principal Mr. A. S. Duncan on or before 30th November 1911. The minimum general educational qualification is the Matriculation or the Upper Secondary Examination. The ordinary rate of provincial stipend in the Secondary Department is Rs 10 p.m. Students

outside Madras Presidency will have to pay a fee of Rs 20 p. m.

The Revised rules for the constitution and working of the Madras Law College appear in Part I (B) of the Fort St. George Gazette—3rd October, 1911.

Owing to the unavoidable absence of Mr. S. Srinivasa Iyengar, High Court Vakil of Madras an old student of the Madras College, the chair was taken by Mr. P. N. Naganadha Iyer. The chairman proposed the toast of His Majesty the King Emperor George V, and dwelt on the good qualities of our much-lamented Queen Victoria and on the short but happy reign of Edward VII, and on the sympathetic and benevolent spirit of our present King-Emperor, of his recent travels, and of the coming Darbar. The toast was lustily responded to, and "God save the King" was sung. Mr. Gopala Menon, Barrister at Law, proposed the toast of the "University," and this was responded to by the Hon'ble Mr. T. V. Seshagiri Iyer, of Madras, who happened to be at Madura on professional business, in a lengthy speech. The toast "Sister Institutions" was proposed by Mr. C. S. Antony, of the Madura College, and seconded in an equally lengthy speech by the Reverend J. S. Chandler, of the American Madura Mission, and the proceedings came to a close. The sports took place in which the junior students of the College and its branches took part. A football match was played between the old boys and the present students, which lasted only about a quarter of an hour owing to the rains. Mr. V. Ramachandra Iyer M. A., Personal Assistant to the Superintendent of Police, in distributing the prizes, regretted that the teachers and the public do not evince a proper interest and enthusiasm for sports and games as they ought to do. In the evening those assembled were treated to light refreshments, and Sesha Bagavatar entertained the audience with "Sita Kalyanam," and the celebrations for the year came to an end to revive again next year.

The Second anniversary of the St. John's College Boarders' Literary Union was celebrated at the College. A foot-ball match between the College XI and a team captained by Mr. S. L. Jansen, a member of the College staff, was played on the College grounds and ended in a draw. The Committee was "at home" to visitors from 4 to 6 p. m., when refreshments were served. The Public Meeting was held at 6.30 p. m. in the College Hall, which was neatly and tastefully decorated. Mr. S. V. Chinniah, the President of the Association, occupied the chair. After the reading of the Annual Report and an address of welcome by the Secretary, an interesting programme of recitations and songs was gone through, to the accompaniment of music. Messrs. G. C. Tambyah, B. A., Advocate, and A. M. Nathaniel B. A. addressed the meeting. They dwelt on the importance of self help, formation of character and necessity of industrial education. The Chairman's remarks and the singing of the National Anthem brought the proceedings to a close. All the arrangements in connection with the celebration were excellent, and testified to the commendable energy and self-sacrifice of the members.

It is gratifying to learn that, after all, a sum of Rs. 10,000 has been sanctioned for the construction of a building for the Trivandrum Law College.

On the application from the Maharaja's College, Vizianagram, for further affiliation in Group (vi) (Two Languages—Telugu and Sanskrit) of the Courses for the B. A. Degree Examination, the Syndicate at its meeting held on October 3rd, 1911, adopted the Report of the Inspectors appointed for the purpose and resolved to recommend the Senate to record its opinion that the application for affiliation may be granted by Government.

The Rev. Dr. Scott, of the Wilson College is resigning his appointment and leaving Bombay. A ripe scholar and a man of great literary ability, a teacher pursuing the highest ideals, and an assiduous worker, Dr. Scott has left a mark on education in Bombay, and

made many personal friends. His influence has been felt not only in the College, but in a wider field. In the University he was a strong protagonist of reasoned reform, and his powerful advocacy of concentration and specialisation exercised a material effect on the deliberations of that body.

The College Cricket team are to be congratulated on the splendid successes they have achieved this year in the Northcote Shield matches. It is a peculiar pleasure to recall the fact that the College was the first in Poona to win the Northcote shield and now when it has repeated the feat after seven years it has still no rival in Poona to share that honour.

The following members of the College staff are appointed University Examiners for this year's examinations:—Principal Paranjpye : Mathematics at the I. E., I. Sc., S. E., S. C. E., L. C. E., B. Sc., B. A. and M. A. Professor Rajavade : English at the P. E. Professor Pause : Sanskrit at the P. E. and I. E. Prof. Kantikar : Physics at the I. E., I. Sc., B. A. and B. Sc. Prof. Bhate : Logic and Moral Philosophy at the I. E. and B. A. Prof. Patwardhan : Marathi at the M. A. Pandit Vasudeo Shastri Abhyankar : Sanskrit for the Sujna Gokalji Vedanta Zala Prize.—*Fergusson College Magazine.*

The annual Examinations of the local Male and Female Training Colleges have commenced, while the examination of the State Middle School being over, the promotions have been made. The examination of the Alfred High School is going on. Out of 150 scholars of the Matriculation class 68 have been given forms to appear at the coming Matriculation examination, and 11 have been sent up for the School Final Examination.

Pandit Prabhu Datt Shastri M. A., Ph. D. has been appointed to act temporarily as Professor of Philosophy in the Government College, Lahore.

A very cordial reception was given at the Agra College to Mr. Jones, Principal, on his return from England. The College hall was tastefully decorated and after prayer an address of welcome to the Principal was read by

Mr. Brij Behari Lal, B. A., and a few other Urdu addresses followed. Prizes and medals were awarded to the winners of athletic sports. Mr. Jones replied to the addresses. All the students were in their light blue College head dress. A garden party is to be given in his honour later on.



List of students successful at the City and Guilds of London Institute Technological Examination, held at Serampore, 1911:—Cotton spinning—11 passed of whom 6 belong to the 1st year and 5 to 2nd year. Cotton Dyeing 4 passed. Mechanical Engineering—2. Electrical Engineering (Elementary) 1. Cotton weaving—13 passed of whom 8 belong to the 1st year and 5 to the second year.

Of the successful students from the Bengal Technical Institute at the final examination the following have been awarded post graduate scholarships: 1. Satish Chandra Banerjee, for the research work in Chemistry in Institute Laboratory (tenable for 2 years). 2. Hiron Kumar Gupta (for study in Geology in England.) Special post graduate scholarship has been awarded to Juanendra Nath Das Gupta for study in Chemical Technology in the Imperial University of Berlin.

The Weir Prizes are instituted from the Weir Reception fund. These prizes are to be awarded to students of the Fardunji Parekh Technical Institute at Surat.

Four Scholarships from the Coronation Celebration fund, are to be awarded to four best boys of the Fardunji Parekh Technical Institute at Surat: One in Carving, one in Carpentry and two in Fitting.

Rules for the grant of Technical Scholarships tenable at the Victoria Jubilee Technical Institute at Bombay:—(1) Three Scholarships will be awarded to Natives of C. P. and Berar for a course of technical training in textile industries, (2) Minimum Educational Qualification is the Matriculation Examination of the Allahabad University, but preference will be given to students who passed the Intermediate or the B. Sc. Examinations, (3) value of these will be Rs. 30 for B. Sc.'s, Rs. 25 for those who passed the Matric. or Intermediate, (4) applications to reach the Director of Public Instruction, C. P. by the 1st of Nov. 1911, (5) the course is for three years (6) an entrance examination of the Institute to be held in January 1911 must be passed by students who passed the Matric.

It is stated that the Secretary of State has now made appointments to the three new special schools recommended by the Industrial Conference which sat at Naini Tal in 1907. These include a School of design at Lucknow, Carpentry School at Bareilly, which is already the seat of flourishing industry in cabinet making, and an experimental Weaving Station at Benares. Buildings have been ready for some time and now that Principals have been appointed and are actually on their way to India the opening of the schools may shortly be expected.

The causes of the waning popularity of the Agriculture College at Lyallpur are in the opinion of the *Tribune* two-fold. First, the fees charged therein have been recently raised and are above the capacity of the bulk of the students. Secondly, the best class of students is not admitted into that College on account of the extraordinary preference that is given there to agricultural tribes to the exclusion of meritorious students. In the first year of the opening of the College, there was a large influx of applicants. The best among them were, however refused admission and the impression since then has gained ground that the College is closed against all but the favoured agricultural castes. No one has ever suggested that the standard in the College should be lowered, as some imaginative critics appear to think.

All that is wanted is that meritorious boys should be attracted to the College and the fees lowered. It is not good policy to turn away the best students merely for the sake of allowing more time to the professors for experimental work.

OTHER EDUCATIONAL ADVANCES.

THE HINDU UNIVERSITY.

On the invitation of the Hindu citizens of Amritsar the Hindu University Deputation again visited Amritsar. A meeting was arranged in the spacious compound of the Hindu Sabha School and over 3,000 Hindus were present. Rai Sahib Giridhari Lal presided. Rai Bahadur Lala Gopal Das Bhandari opened the meeting. The Hon. Pandit Madan Mohan Malaviya spoke of the virtues which had been the bulwark of Hindu civilization in the past, and how it was again possible for Hindus to raise themselves in the estimation of nations. He said this was possible only if western education was given along with Hindu religious education. The speech was followed by the announcement of subscriptions which amounted to Rs. 70,000. It is hoped Amritsar will subscribe over a lakh.

At a well-attended meeting held in Muzafrarnagar Lala Sukhbir Singh and Kumar Jagadis Persad subscribed Rs. 10,000 each.

The public meeting which was announced to be held on the afternoon of the 9th near the Water Works reservoir in connection with the Hindu University came off in the morning at Bradlaugh

Hall owing to a sudden change in the programme of the deputation. The hall was overcrowded by Hindus of all classes and the proceedings lasted till about twelve. Mr. Lajpat Rai, Moonshi Gangaprasad, Pandit Deendyal and Pandit Malaviya addressed the meeting. The donations announced at the meeting amounted to nearly a lakh. With reference to Mr. Lajpat Rai's suggestion about the need of technical education Mr. Malaviya said that half the amount raised would be devoted to a technical institute. The Mahomedans decorated their

mosques and expressed good wishes for the success of the Hindu University scheme.

The Maharaja Bahadur of Durbhanga, Raja Rampal Singh and the Hon. Pandit Madan Mohan Malaviya arrived at Meerut on the 16th October in connection with the Hindu University and were accorded a most enthusiastic reception. A public meeting was held in support of the Hindu University movement. The Maharajah of Durbhanga was voted to the chair. The Maharaja made a lengthy speech and in justification of a Hindu University said:—"I hold that an education which does not provide for instruction in the religion of one's forefathers can never be complete and I am convinced that a Hindu will be better Hindu, a Christian a better Christian and a Mahomedan a better Mahomedan, if he has implicit faith in his God and in the religion of his forefathers. I have never believed in a Godless education and have invariably advocated the necessity of combining secular education with religious training. I join in the movement for the University in the earnest hope that it will produce this happy combination."

The Maharaja of Durbhanga on leaving Meerut will visit Aligarh, Delhi and Benares to raise funds for the Hindu University.

A meeting of the Hindu residents of Bahraich was held in the Lyall Library in connection with the University scheme, Rai Sahab Seth Sambhu Nath, Honorary Magistrate, presided, Pandit Gokaran Nath Misra, of Lucknow addressed the audience on the aims and objects of the University. A strong representative working committee was formed. It is expected that Bahraich will contribute Rs. 50,000 to the funds of the University.

The Maharajah of Durbhanga and the Hon. Pandit Madan Mohan Malaviya had private interviews with the Viceroy and they also conferred with the Hon. Mr. Harcourt Butler Member in charge of the Education Department about the proposed Hindu University. Subsequently the Maharaja of Durbhanga, the Hon. Pandit Madan Mohan Malaviya Mr. A. Chowdhuri and Mr. Jogendra Nath Mukherjee had an informal conference at Durbhanga House

where a formal letter was proposed and sent over the signature of the Maharaja to Mr. Butler informing him of the existence of a widespread feeling for the establishment of a Hindu University in India and enquiring about the Government attitude and intentions. It is understood that the Government of India are in active sympathy with the movement and a gratifying letter of assurance has been received from the Hon. Member in charge of the Education Department. The next step will be the formation of a deputation which will wait upon the Government of India with forward proposals for the constitution of the Hindu University which it is understood will be settled during the next few weeks.

Maharaja Bahadur of Darbhanga has subscribed Rs. 5 lakhs to the Hindu University Fund.

A meeting has been arranged with Mrs. Besant on the 26th instant at Benares when it is expected that a clear and definite understanding about her scheme and the future of the Central Hindu College will be reached.

MOSLEM UNIVERSITY.

The Moslem University Foundation Fund totalled Rs. 11,74,103-14-7 on the 10th instant.

The collections in Madras to the Moslem University Fund totals Rs. 32,718.

The following is the copy of a cablegram from His Highness the Aga Khan, to the Hon'ble Sir Rajah Bahadur of Mahmoodabad Dated Marseilles, the 11th September 1911: 'Have telegraphed my Agent Jafer pay my subscription. Have begged Highness Rampur. Heartily thank all who have paid promises. Please make great almost super human efforts. Travel and get all promises paid. God will reward you all. Now is the supreme moment. I beg you, if necessary, appeal publicly in all our names to public to pay subscriptions.'

A despatch is shortly to be sent to the Secretary of State on the subject of the proposed Mahomedan University at Aligarh.

The Lahore Hindu Elementary Education League has started one free primary school for teaching Hindu boys.

Sj. Prof. Balkrishna, M. A., (Gurukul Deputation) visited D. I. Khan, Shujabad, and Lodhvan during the last week and collected Rs. 500, 230 and 100 from these places respectively for the Kula.



All the Universities in the British Empire have been invited to send representatives to a congress to be held in London in 1912 to consider matters connect-

Empire
Universities
Congress

ed with organisation; the relationship of Universities to teachers, undergraduate students and schools; agencies for higher education, and other subjects which may be suggested from time to time. The arrangements are being made by an influential London Committee, of which Prince Arthur of Connaught is the President. The Secretary is Dr. R. D. Roberts, the Registrar of the University Extension Board of London, who has just returned from Canada, where he attended a Conference of Universities called to discuss the programme for the London Congress. Dr. Roberts says the "Educational Times" stated in an interview "The conference discovered it was an excellent means of discussing matters of purely local concern. In that way the Congress to be held in London next year will have an important bearing on University life."

The University of Breslau has just celebrated the hundredth anniversary of its foundation. The German Emperor announces that in future it is to bear the name of King Friedrich Wilhelm III, like Berlin and Bonn, the two other University Foundations of that monarch's reign.

The experiment of special Indian lecturers at the London School of Economics does not appear to have been a success, judging from the fact that the programme for the new Session commencing on October 9th contains no Indian subject. It is to be regretted that the lectures did not attract a sufficient number of young Indians and others to

Indian
Lecturers on
Economics

justify their continuance, having regard to the fact that there are hundreds of Bar students now in England from India with abundant leisure for additional studies.

The latest report of the United States Commissioner of Education gives interesting statistics of the so-called land-grant colleges, established under the provisions of the Act of Congress of 1862, and receiving aid from the Federal Government from funds provided by Acts of Congress of 1890 and 1907. Each State received from the United States Treasury during the year ended June 30, 1910 the sum of £8300 for the benefit of these land-grant colleges—commonly called agricultural and mechanical colleges—making a total of £400,000 exclusive of the sums paid for experiment station purposes, expended by the Federal Government in aid of these colleges. There are sixty-eight of these institutions, 16 of which are separate institutions for the coloured race. These colleges are in rapid growth (says *Educational Times*) shown by a marked increase in the number of instructors and students and the value of their property and income. The total number of instructors during the year in all departments of the 68 colleges was 6663 of which 742 were women. The total number of students enrolled for the year was 80546 an increase of 9.6 p. c. over the preceding year. The total value of the property held for the benefit of these colleges amounts to £23,568,600, an increase for the year of £910,000. The total income from all sources, excluding the grants for experimental stations, was for the year about £4,182,000, an increase of some £459,000 during the year.

Among the bequests of M. Marino Corgialeagno, a naturalised British subject, are (says "Nature") £40,000 to institute a school at Athens on the lines of Eton or Harrow, "sharing the desire expressed to me by his Majesty King George that education in Greece should be rendered more perfect by the establishment of a public or Secondary School upon model of the English public schools where boys will receive a regular course of teaching as well as good breeding"; £40,000 for a school for craftsmen at Argostoli in the island of Cephalonia; £15,000 for technical scholarships; £10,000 each for the public library at Argostoli for the Agricultural Society at Athens for a polytechnical hospital in Athens and for the Society for the Propagation of Useful books.

The Executive Committee of the Trade Union Con-

gress and the General Federation of Trade Unions are founding at Ruskin College Oxford, a series of Trade Union Scholarships. All unions affiliated to the Congress and the Federation will have the right to nominate candidates for a matriculation examination.

THE spread of the university extension movement in many parts of the country is a healthy sign of a growing desire for intellectual acquirements, because it shows that, apart from those students who are reading with a view to graduation, there are large numbers of others desirous of improving their own mental equipment without any immediate and particular purpose, beyond that of their individual educational progress. For twenty-five years this work was carried on in the Metropolis by the London Society for the Extension of University Teaching but since 1902, when the University of London was reconstituted, and, from being merely an examining body assumed the additional functions of teaching and lecturing, it was naturally handed over to that institution. The general idea underlying university extension is, of course, that of making adequate and systematic provision for the continued higher education, in some particular branch of study, of students whose school life carried them to what may be conveniently called the intermediate stage, and who, although occupied in the day-time in some ordinary walk of business or professional life wish to devote their evening hours to serious reading.

The young Maharaja of Jodhpur is entering Wellington College this term, but he will only be a day boarder and will live with his guardian Capt. Strong and a tutor at a house a short distance from the College.

Mr. L. H. Arndt, a Ceylon Student third son of the Rev. G. A. II. Arndt of Negombo, late sub-Warden of St. Thomas' College, has, we are glad, passed the Indian Civil Service Examination held in England. There were 300 Candidates representing all parts of the Empire, and Mr. Arndt, was placed 22nd, in order merit.

Mr. G. V. Bevoor of Bagalkote has passed the I. C. S. examination. Mr. Bevoor is a distinguished graduate from the Deccan College and proceeded to England in 1909, receiving help from the Hindu Education Fund. He joined the Sydney Sussex College in Cambridge passed first class Science Tripos this very year and has now come out successful at the I. C. S.

The result of the recent competition for the Home Indian and Colonial Civil Services published show 93 passed, of which three are Hindus. — Sonti Venkata Ramamurty, who is twentyfifth in order of merit, Gurnath Venkatish Bevoor, who number 73, Hiranand Khushiram Kirpalani, 76th. Ramamurty and Kirpalani entered their names for all the three services, and Bevoor for India only but it depends upon the final allocation of the candidates whether he receives an offer of appointment.

FERGUSSON COLLEGE STUDENTS.—Mr. Y. K. Kuntay passed his second part of the Mathematical Tripos. He will be eligible for his Cambridge degree in December and will in all probability return to India in January next. Mr. P. R. Awati got a second class in the Natural Science Tripos. Mr. Y. A. Godbole after only one year's work got a third class in the first part of the History Tripos and Mr. B. K. Bhate secured again after a year's work a second class in the first part of the Mathematical Tripos. Two old Fergussonians, Messrs G. S. Marathe M.A. and M. R. Tambe B. A. I. C.E. recently proceeded to England to prosecute their studies in the higher branches of Commerce. Mr. Marathe has already passed the Second Part of the examination held by the Institute of Actuaries. He had passed the First Part last year.

DEPARTURES.—Mr. S. Maulik Assistant Forest Zoologist, Dehra Dun is leaving Bombay for England by the S. S. "Bohemia" on October 16th. He will study Biology at Cambridge and will specialise in Entomology at Cornell, U. S. A. Mr. R. Maulik leaves by the same steamer for London on the 16th October. He will study printing in London and Cambridge.

The attention of the public is invited to the fact that a Central Provinces Students, Advisory Committee has been constituted with its head quarters at C. P. Advisory Committee Nagpur and that any information desired by students from the Central Provinces and Berar intending to proceed to England can be had on application to the Secretary of the above committee Mr. S. R. Pandit, Nagpur.

THE EDUCATIONAL IDEAL.

With deep interest do I approach the subject concerning 'The Educational Ideal.' Investigation and experience have suggested to me certain ideas which I wish to submit to your thoughtful attention.

And I notice with joy that a new interest in educational matters is quickened all over the

Land. We are face to face with the Problem of Education as never before. There is a deeper apprehension today of the function of knowledge as not a mere abstraction but as a force, an operating principle in individual and national life. The Hindu indeed has from the beginning of his days been a lover of Culture, and the homage he pays to *Saraswati* is an acknowledgment of his reverence for knowledge. The origin of the *Devanagari* character is lost in antiquity and India, I need hardly remind you, was familiar with the art of writing long before any other nation of the world. Ancient India was not familiar with the Mechanical appliances which steam and electricity have secured for the modern age, but ancient India was familiar with the art of writing. Not silver and gold but the wealth of learning was the passion of the past. The Hindu elevated inquiry, *mimansa*, to the dignity of a religious pursuit. Sankara—the greatest of India's thinkers—has been honoured as a saint, an *acharya*, a teacher of the truth. And did not India build up the seminaries of Kasi and Navadvipa as famous as the schools of Athens and Alexandria?

So true it is that India has worshipped wisdom from the beginning of her days. Again and again do our national scripture speak of the greatness of *gnan*. It was recognised then as it is being recognised by the younger nations of the West today, that education must be the real basis of National Life. At the Annual meeting of the British Association for the Advancement of Science, a few years ago, the President in his inaugural address, developed the idea that education was from the national point of view, more important than warships and canon.

Haldane remarked not long ago that Education was to solve the Problem of the future and in the hour of her great need and financial stress, Germany under the leadership of her thinkers, turned to Education to remedy her weakness and organise her economic resources. There is a growing interest in child-psychology today and during my visit to Germany and England my heart glowed with admiration as I saw in the great centres of western civilization the operation of the new

forces making for a New Educational movement, rich in promise, rich too in the resources which show that the White Race is vital still. The Universities of Jena, Berlin, Oxford, Cambridge, London, Durham, Manchester, Liverpool, Leeds, Sheffield, Birmingham, Bristol, Nottingham are a witness to the presence and power of this New Educational Movement.

But the conflict of educational ideals is no less conspicuous than the presence of the New Educational Movement. Read such a book as Compayre's *History of Pedagogy* and you understand a little of the conflict in the educational camp. Some prophesy in the name of Herbart; some are pledged to Froebel. Some are against awarding degrees to women, some say 'women ought to be educated like men especially in mathematics'. Some say motor work 'develops brain-centres as nothing else does'; others say the study of foreign languages "fibres the mind." Some advocate Science; some languages and literature. There is multiplicity of counsels.

II

It seems to me that the *educational ideal* must be determined by the *Ideal of Life*.

There is the old *ecclesiastical ideal* according to which life is obedience to an external authority—the authority of a church or a scripture. Repeated conflicts between Reason and ecclesiastical authority have discredited the old ideal; and we discern today that *Truth* must not be confounded with *Tradition*. Tradition and authority must not play the tyrant, but must be pressed in the service of the truth we seek. Education is more than tradition. According to another theory *education is preparation for life*. Thus Spencer says in his "Education"—"It behoves us to set before ourselves and ever to keep clearly in view, *complete living* as the end to be achieved." But the question arises: what is *complete living*? Spencer's realism furnishes no satisfactory answer to the question.

But I think Spencer's definition of life is luminous and may help us greatly in determining the ends of education. Spencer defines life as

the adjustment of inner relations to outer environment. And I may say the end of education is *self-realisation through continual self-adjustment to the natural and the social or ethico-religious worlds which constitute the environment of man*.

I have not at any time concealed or attempted to conceal that I desire to interpret all problems in the light—to me the master-light—of the spiritual Ideal of Life. And I hasten to say that my view of education is determined by the moral or spiritual aim of life. The controlling principle of all true education is a definite ethical life-purpose. The educational ideal is to train the pupil to rise on the stepping stone of sense perception and thought to a recognition of the Ideal immanent in the institutions and appointments of Life.

Prof. Sadler was right when he wrote that educational theory was the "focus and the meeting point" of the moral sciences. And Herbart's view—that culture brings morality—may well be endorsed by us if only we make Culture representative of that inward attitude which seeks the Truth as the harmonious blending of thought and goodness. The ultra-intellectual view of Truth must be abandoned for this ideal is the view according to which Truth involves *thought* and *goodness*. True culture passes beyond the 'factual' order and moves among the world—of the moral values—the wonder, the beauty, the authority of Truth.

Fogazzario the Italian writer has a beautiful novel "The Saint". We read therein how as young men came to this saint with a number of questions concerning life and its problem, the Saint ever answers:—"knowing by doing". So it is: truth is a function of Life, not an abstraction of the understanding; and to know the Real, we must exercise self-directed attention, no less than moral self-control. Thought and goodness are the contents of true Culture. Culture fails of its purpose if it be not a knowledge of the Good. So we read in the Upanishads:—"The secret cannot be gained by knowledge which is unwedded to goodness."

The end of education, then, is more than informational it is *developmental*. Truth is more than

mere facts : truth is an *organism* and its contents are *facts* and *ideas* or *principles* not to cram the mind with tit-bits of information but to develop the philosophic attitude, the scientific temper, the sympathetic interest, the ethical instinct is the end of education. Educational ends include development of intelligence, culture of the will and discipline of the emotions.

May not this view of the educational ideal and educational ends reconcile conflicting theories ?

Philosophers from Plato to Bacon, from Locke to Spencer have devoted attention to this subject and developed conflicting theories. You read of the theories of the humanist, the realist and the naturalist. The humanist is right in maintaining that the record of human experience as found in the classics of the past must be studied ; only he must remember that that record must be related to the Revelations of the Truth in the Present. Only so can culture escape the contagion of what Miss Adams in her "Democracy and Social Ethics" has called 'the over-literary character of instruction'. The realist is right in pointing out that knowledge must escape the tyranny of words and be related to things—to nature and reality ; only the realist must remember that Nature is not the only realm of Reality, that the world of thought, imagination and emotion reflected in the humanities is also real, that in truth, the empirical is only a fragment of the Real which is the harmony of the actual and ideal. The naturalist is right in pointing out that the child must be prepared for life by living, that education is in the school of action ; but he must remember that the deeper values of life are discerned by communion with the Ideal—that which Plato calls the Idea of the Good.

I plead then for the *organic view of education*. Education must aim at a complete training of the faculties, it must train the senses, the intellect, the feeling, the will, and the intuitions of the pupil. The senses or the body must not be neglected for the state of the body shapes in no small measure the desires of the heart. Education must prepare the student for the pursuits of later life ; it must be a preparation, no less, for the Life beyond this life. It must aim at a realization of the

individual's ability and character with reference to his place within the natural and spiritual environment of his personality.

"A creed is a rod
And a crown is of night,
But this thing is of God,
To be man in thy might,
To grow straight in the strength of thy spirit
And live out thy life in the light."

This self-realisation demands intellectual discrimination, ethical self-control, and the power of right selection through *sympathy*. That sympathy is the secret of right seeing is what many 'Tories of Science'—to use the expressive phrase of Tyndall—seem to forget today. Emancipation of the heart is the need today, of those who are called 'the educated'. So many in India are spending their time and talent to earn livelihood : they forget that life is more than livelihood. In a hymn of great beauty, in one of our sacred scriptures, life is represented as a great *Soma-festival* : Yes, life is meant to be a festival, a banquet with the gods ; yet how few have developed the *understanding heart* to appreciate this truth ? The one truth I would deliver with the passion of Truth is : *Educate the heart*. Tit-bits of information will not give you what you want. More than information is assimilation and interpretation of facts. Learn not to satisfy idle curiosity, not to carve a career, but to *humanise your scholarship* : *spare* what you have with humanity : remember education is *fellowship*. The late Dr. Bain of Edinburgh, in an article, contributed to the *Mind* spoke of the "correlation of forces in man" and argued that *emotion* might be *transformed* into intellect. One thing at any rate, is clear : that *intellect* charged with the emotion of *sympathy* is the condition of right seeing and secures expansion of the self. Montague was not far wrong when he complained that a good deal of what passed as education over-estimated the intellect and rejected morality ! True education introduces us to the true, the beautiful and the good through art, science, philosophy, literature, politics, morality, through a contemplation of the lives of great men, brave deeds, beautiful objects and beneficent laws.

Culture has a moral element in it ; it is knowledge realised as responsibility and service.

(*To be continued*)

T. L. VASWANI.

PLACE OF BIOGRAPHY IN THE HISTORY OF THE WORLD.

One of the most interesting and at the same time perplexing problems of the Science of history is to inquire whether the History of the World is the History of Nations or the Biography of Great Individuals—whether the history of Mankind is but an account of the Saviours of epochs or whether the biographies of great men simply indicate so many landmarks in the history of nations. Do great individuals create history ? or, does history reveal itself through them ? one cannot so readily answer the question if revolutions or changes affecting a particular community or a whole nation are the out come of individual efforts or if they are the manifestations of the evolution of the community or the nation itself.

There is a general tendency amongst us to make gods of great individuals. Great men are supposed to be incarnations or representatives of the Deity, who either himself comes down or sends agents occasionally to set right His rule on earth. Glimpses of this view may be had from the scriptures and Sacred books of all sects and creeds. The founders of religions, the harbingers of new ideas, the prophets of the world, and all religious and social reformers could but evoke for themselves a sentiment that goes towards the Divinity in the heart of these suffering thousands for whom they came, lived, and died. They were looked upon by a thankful posterity with the idolatrous reverence characteristic of a true worshipper, moved by the prayers of the afflicted humanity—such is the common conviction—God had sent them to lash sinking societies to a far more elevated plane. His unbounded sympathy and benevolent anxiety for His most beloved creatures was a subject of constant allusion in the ancient biographical literature. It almost became a fashion

with the old historian to represent his hero as a personification of god, as one of divine heritage. Nay, one of the greatest of the nineteenth century writers has designated greatmen as "Heroes" or gods in human shape and attempted to silence an ever-increasing, heretical voice which tries to reduce a great individual to a mere creature of the time. "He was the 'creature of the Time', they say, the Time called him forth, the time did everything, he nothing—but what we the little critic could have done too ! This seems to me but melancholy work. The Time calls forth ? Alas, we have known Times call loudly enough for their greatman but not find him when they called ! He was not there, providence had not sent him ; the Time calling its loudest, had to go down to confusion and wreck, because he would not come when called * * * I liken common languid times to dry dead fuel, waiting for the lightning out of Heaven that shall kindle it." (On Heroes and Hero worship).

The upholders of this theory almost or wholly ignore the part played by society in any national regeneration. They perhaps regard society as an edifice which the god incarnate or the divine deputy pulls down at his pleasure and rebuilds to suit his own purpose. They seem to leave no room for what is called the life of the nation, which the more modern thinkers are so zealous to maintain. According to the new School, Society is all in all—it is not an aggregate of individuals but an organic unity. It has a life of its own—it feels its needs and strives to meet them—it knows its time and finds its way. The life of the individual is but a phase of the Social life. The individual depends upon Society for his being in a variety of ways—the existence of an isolated individual, one completely insulated from Society from birth to death is only possible in a myth. An individual cannot live without him. Society is far mightier than the individual and does not much care for his actions good or ill. It runs its own course, and an individual, may he be an incarnation of god, can neither hinder nor accelerate its motion, unless it itself chooses to stop or run faster.

If God were really anxious—they might retort—for human welfare, why did He take the trouble of making this long journey from heaven to earth, even when, being omnipotent, he could effect the change by simply saying—'let there be a change'? And even after coming here, why did he require so much time to observe and study the demands of the nation and to devise a remedy acceptable to many? And why did he ponder and hesitate over and over again before he could deliver the message of condemnation and strike the just blow to your 'dead edifice'?

These and similar considerations tend to establish the belief in the absolute supremacy of society over the individual and to subvert the counter-hypothesis which attributes any and every social change to the action of great men. "The genesis of societies by the action of great men," says Mr. Spencer: "May be comfortably believed so long as, resting on general notions, you do not ask for particulars. But now, if dissatisfied with vagueness, we demand that our ideas shall be brought into focus and exactly defined, we find the hypothesis to be utterly incoherent. If, not stopping at the explanation of social progress as due to the great man, we go back a step, and ask, whence comes the great man? We find that the theory breaks down completely. * * * Is his origin super-natural? Then he is a deputy God, and we have theocracy once removed, or, rather, not removed at all * * * Is this an unacceptable solution? Then the origin of the great man is natural, and immediately this is recognised, he must be classed with all other phenomena in the society that gave him birth as a *product* of its antecedents. Along with the whole generation of which he forms a minute part, along with its institutions, language, knowledge, manners, and its multitudinous arts and appliances, he is a *resultant*." (Study of Sociology). Great individuals are thus the representatives of a nation. The greatness that we find in them is only a measure of the greatness of the society to which they belong. They show only the highest level attained by society at a particular period.

We have heard both the parties. Each ap-

pears to be one-sided and extreme in its assertions. Each is eager to maintain itself against the other rather than to find out the truth. The one affirms what the other negates and negates what the other affirms. We cannot but admit the existence of what may be termed the social life but in the same breath we also admit the importance of great individuals. The individual and the society are thus the two factors of any great change, intellectual, political, religious or social. However tremendous may be power acting behind society, it needs but the magic touch of individual greatness to manifest itself. A society on the eve of a revolution is like a loaded gun ready for action, which, to be fired, must receive the spark of individuality. True, individuals may not stop the movements of society, but at any rate they can direct its progress. They may not resist a rushing Rhine but they can alter its bed by opening up different channels for it.

It may however appear in some cases that the social factor is more conspicuous and prominent than the individual, so much so that there is a general tendency to leave the individual factor altogether out of account in every case. This would be an induction too hasty to be of any scientific value. It fails, as it must fail, to explain an extreme case on the opposite side, viz, a case in which the importance of the individual overshadows almost completely the importance of society. We may remember in this connexion how an individual like Hannibal could revivify the whole of Carthage by mere personal electrification so that as soon as the connexion was broken between him and his race, the latter once more showed all the signs of mortality. Throughout the second Punic war we find one single individual trying his utmost to thwart the haughty and overbearing steps of an entire nation. The Carthage of his time was but a creation of Hannibal's. It was he who roused the whole city from an ignoble slumber—but alas! it was not yet dawn, it was not yet the time to arise, the curtain of darkness was still hanging upon it—and hence his failure. Yet it was Hannibal who led the Carthaginians like dogs at his heels from

the shores of a dark continent, through the wild mountains and mountaineers of Spain, far beyond the heights of the Pyrenees, across the tumultuous Rhone, down the bleak and hostile Alpine precipice down the thorny plains of Italy, down to the proud gates of Rome itself. And what has our Evolutionist to say to this? Does he still ignore the greatness of individuals? Carthage before and Carthage after—each presents a meagre contrast to the Carthage of Hannibal.

But, as hinted above, this is a rare example and to build our theory solely upon this would be quite unsafe. What it proves is simply this: we should not treat with individuals as lightly as we are prone to do. They are more than mere by-products in a social chemistry, they are some of the elements of which a compound is made rather the battery current which brings the simpler ingredients in a need combination. If, however, we assert a little more than this, we will be asserting too much. We may say at best that to effect a great change there must always be a great man whose individuality we cannot explain away. But it must at the same time be admitted that the change to be possible at all supposes a preparation on the part of the nation, in that department at least which will be directly affected by it. Thus when we read, for example, the intellectual growth of a people, we can often anticipate changes that actually follow. And these anticipations are sometimes so very telling that the historian runs at once to extend to the problem his newly acquired theory of Evolution without modification. In his earnestness he forgets that a change cannot come out of a mere combination of circumstances from which a society has just emerged. The antecedent conditions are not by themselves sufficient to *produce* a change, they simply render an *occasion* for the change to be brought about by an agent foreign to themselves. The time and the man must meet before there can be any change worth the name.

The History of the world is thus the History of nations as well as the Biography of greatmen. The History of Human Societies explains,

and in turn, is explained by the History of Individuals.

S. K. BURDHAN.

PHILOSOPHY OF RELIGION.

Chapter II.—Science of Religion.

HOW CAN THERE BE A SCIENCE OF RELIGION

But the province of science is distinct from that of religion. Science deals with natural things and religion with supernatural. Science depends on sense-perception and generalisation which are impossible in the case of spiritual objects and hence supernatural things can not be investigated in the same way as things natural. The objects of spiritual knowledge can not be perceived by the senses nor can they be generalised out of the materials supplied by sense perception. Human knowledge is absolutely limited to things finite and phenomenal—it cannot take account, in any way, of what lies above the objects of sense-perception. How can then there be a science of religion? No doubt our senses supply the materials for knowledge, but what are those materials if they be not supplemented and interpreted by our power of cognition? The materials of sense are interpreted by our cognitive power which is above sense, and only when they are so interpreted they can be of use to us, can help us in attaining knowledge. The finite things and minds are objects of Science and from the collective world of finite things and minds considered as system of effects we can, by reasoning backwards, discover the ultimate causal power to which their existence and attributes are due. We can not only discover the existence of God, but we can also discover His nature by a careful study of the nature of the effects, of the form and order of finite things and minds. Science deals with the world as it appears to us; but the world can not explain itself; the unity of the world can only be explained on the supposition that everything has originated from and is upheld by God. Science only discovers the order and beauty and harmony of the world and religion explains them by showing that

material nature, organic existences, the mind and heart of man, society and history, have all originated in a power wisdom and goodness which upholds them and works in and through them.

RELIGION AND IMAGINATION.

The sphere of religion, it is said, is above the faculties of knowledge, is beyond the reach of all possible experience; but though it is unknowable, yet imagination reigns here unrestrained and religion is the product of the imagination and no scientific treatment of it is possible. In this way Spencer reduces religion to the worship of the unknowable. But is not such worship of the unknowable an impossible attitude of mind? Can we worship what we know to have no reality but to be only a product of *our own* imagination?

RELIGION AND THE RELATIVITY OF KNOWLEDGE.

Sometimes it is argued that the infinite is unlimited and therefore unthinkable, for, to think is to limit in space and time. To think is to discriminate and assimilate, is to think the conditions and the limits in time and space under which a thing appears. It follows, then, that the infinite is unthinkable, for, the infinite is that which has no limit but it is by the limits that we think a thing. Also to think is to condition and therefore, the Absolute which is unconditioned is unthinkable. Hence, Theology, based on the idea of God is unscientific and groundless. But is it possible to think of the finite without thinking of the infinite, of the conditioned without thinking of the Absolute? Hamilton would say that the infinite and the absolute are the negative ideas of the finite and the conditioned which are positive ideas. Hence, it is not science, but revelation, which can give us an idea of God. Spencer, however, holds that the ideas of the infinite and the absolute are not negative ideas but positive ideas with real content, for finite and relative knowledge will have no meaning unless tacit reference is made to an infinite and absolute. But Spencer contradicts himself when he holds that the absolute is unthinkable and unknowable and still a positive idea with a real content.

Thought is not wholly subject to the principle of Relativity, as Spencer supposes, for, the Absolute being a positive idea can not be outside the limits and conditions of thought. Thus we see that thought of the absolute is not impossible.

Chapter III —Intuitive Nature of Religion.

RELIGION AND INTUITION

Science is discursive and it depends on mediate reasoning while religion is intuitive and it depends on immediate self-evident truths. We intuitively come to know that God exists, that we are dependent upon him and that it is our duty to worship him. Such ideas as the reality of God, our dependence on him and our duty towards him, no matter whatever their sources are, are forced upon us by an inherent necessity of our nature. They require no proof self-evident as they are; they are above reason because, what rational thought can tell about God is narrow, insufficient and incomplete, and because reason introduces an element of doubt which religious faith can not tolerate. Religious truth comes to us spontaneously and with self-evident convictions. If religion depends on abstract reasoning as Spinoza, Leibnitz, the Utilitarian of the 18th century and Kant himself hold—they are all rationalists, whether dogmatic or critical—then religion would be possible only to philosophers and to people trained in abstract reasoning. But this is so far from being the case that religion is felt most strongly by people whose abstract reasoning powers are most undeveloped. It follows, then, that the religious truth can be discerned and felt intuitively by all without abstract reasoning. The reality of God and the spiritual world are not inferences at all but immediate feeling and intuition. Religion, no doubt, must have spontaneous and apparently self-evident convictions, but still philosophy is necessary, for its business is not to produce direct religious results but to justify intuitive beliefs, to show how necessarily they arise from the very nature of things and to correct and free primitive intuitive beliefs from illusions and superstitions to which religion is liable to be perverted if unrestrained by Philosophy.

DEMONSTRATION OF GOD IS NOT POSSIBLE.

Intuition and revelation are the only sources of religion and Philosophy of religion is not possible, for, it implies that God's existence can be demonstrated but demonstration requires a standard higher than God which is absurd, for, God is the highest standard. But philosophy does not attempt to deduce God from anything higher than Himself; it simply shows, by reasoning backwards from the world of finite things and minds, that God is the ultimate ground and source of all finite things and minds and that He is self-existent.

INTUITION AS THE BASIS OF CERTITUDE.

It is argued that intuition is the basis of certitude and the certainty of immediate knowledge is bound up with the certainty of mind itself. But many notions seem to be intuitive but are not really so; habit and association give rise to many false notions and it is the business of Philosophy to distinguish true intuitive beliefs from false ones. Moreover how can the knowledge of God be intuitive when we see that the idea of God is complex and resolvable into such ideas as intelligence, power &c. all of which are predicable of things other than God? Hence any intuition which may be involved in their apprehension is not an intuition of God. How can you reconcile the intuitive knowledge of God with His revelation in Nature and Scripture? If He is known by intuition then wherein lies the necessity of His revelation? If all men had an intuition of God, then how is it that whole nations are found to worship monstrous Gods?

Chapter IV.—Revelation and Religion.**PHILOSOPHY OF RELIGION SUPERFLUOUS.**

Revelation is the necessary presupposition of religion. Religious knowledge is given in a positive revelation, for truths of religion are inaccessible to reason. Hence revelation is necessary and Philosophy superfluous. There must be an element of revelation in religion, for, there can be no religion if there is absolute isolation of the divine spirit from the human; the divine spirit

must communicate itself, and thereby in some sense must reveal itself to the human. No revelation, no religion, we admit, but does it follow that revelation excludes altogether the activity of reason? Some philosophers even go so far as to assert the absolute opposition between revelation and religion: what revelation asserts, reason denies and what reason asserts, revelation denies. But how can faith and reason exist side by side saying opposite things and yet avoiding conflict? Is human spirit a thing divided against itself? Others, however, maintain that revelation does not contradict but transcend reason. Nothing can be accepted as revealed which contradicts reason, but revelation may communicate what transcends reason, what is inconceivable by reason. But is reason a thing which can be quantitatively distinguished so that what is comprehensible to one degree of reason may not be so to another; and can there be any revelation of what reason can not comprehend? Can revelation make conceivable what is inconceivable? Revelation can satisfy, can rectify, but cannot create religious instinct, and it cannot explain the universality of religious ideas.

Chapter V.—Finite mind and Universal Consciousness.**RELIGION IS A NECESSITY.**

Thus we see and that philosophy of religion is possible and necessary and its business is to determine how the mind transcends its own finite circumstances, how it knows things eternal and unseen, how we get the idea of God, what is the nature of God and what is the relation of man to God? Every man has a natural tendency to solve these questions and the effort to solve them shows that religion is a necessity. By the necessity of religion we do not mean that every individual understands the necessity, that every man must be religious that there are common elements in all religions, but we mean that there is a natural tendency in man to aspire after the absolute mind. But why this tendency? Because of the potential infiniteness of the mind, of the self-consciousness being an imperfect reproduction of the universal consciousness. But how do we know that mind is

potentially infinite? Because it always transcends its own limits; it always tries to know more and more—to think of present, past and future; it is its very nature to transcend limit after limit and include more and more within it; it feels its own potential infinitude and therefore necessarily forms the idea of real infinitude; it, being an imperfect reproduction of the universal mind, can reproduce within itself Nature which is a product of the universal mind. Moreover, limit implies its transcendence—virtual or actual and thinking of a limit implies thinking of a reality beyond which has another reality at its back and that another and so on; but such progress is unthinkable, so that we can not help thinking of a real positive infinity including all limits. Thus we find that mind being potentially infinite can rise to the idea of a universal thought.

Chapter VI.—Nature of Religion.

ASPECTS OF RELIGION.

Religion has two aspects, subjective and objective. Subjectively it is the experience of the conscious relation to a transcendent agent on whom we depend and objectively it is the beliefs and practices connected with this experience. Religion is either Natural or Revealed. We can by the aid of our reasoning power derive some knowledge of the reality of Soul and of God, of the responsibility of soul to God, of the freedom of the of human will, of the immortality of the human soul, and of the attributes of God as manifested in nature. Such knowledge is Natural Theology and religion founded on knowledge, acquired in such natural way is Natural Religion and it is the business of Logic and philosophy to teach us how to use our reason properly so as to arrive at the true Natural Religion. Some, however, hold that there are limits beyond which reason and Natural Religion can not go—there is a limitless sphere of reality beyond the reach of human reason which is nevertheless not contrary to reason, too remote and too complex to be grasped by ordinary human reason. Therefore, if we are to know any thing of this sphere of truth which is beyond our reason, it must be specially revealed to us by God and such truth must be revealed to us because it

is necessary for our future well-being. The knowledge of God thus communicated by direct revelation is Revealed Theology and religion as based on it is Revealed Religion. Theology is the intellectual ground of religion.

Chapter VII.—Religion and Science

SCIENCE DOES NOT CONTRADICT RELIGION.

There is a close connection between Science and religion—there is no contradiction between religion and physical Science. Science explains the mechanism by which physical changes come to be, but this explanation is not self-explanatory, it requires in its turn another explanation and this explanation is in the postulate of a divine will which works through the mechanism of nature to reach moral ends. "The only quarrel which the Theist has with the man of Science, arises if the latter offers his partial and abstract explanations as complete explanations." "Religious thought and physically scientific thought about the world," says Dr. Fraser, "instead of destroying really strengthen one another, in the recognition of one continuous divine activity, or endless creation, under the form of one natural law order. For the natural order of procedure may be interpreted as one form of the universal revelation of the perfectly reasonable Will." Says Dr. W. N. Clarke "The vaster the sum of matter and motion, force and life, spirit and meaning, that we discover in existence, the more urgent the necessity of recognising some adequate source, spiritual, intelligent, and purposeful, from which it has proceeded. The universe as known to the Scientist demands God for its course for more urgently than did the heavens and earth as known to the patriarch or the psalmist. The earliest assumption of human thought that an adequate producing power is implied in the existence of what we see, is also the testimony of the visible universe, with its immeasurable vastness and its infinite variety. Nothing is more certain than that Science in its maturity will affirm one spiritual cause for the universe"

(To be continued)

C. C. SINHA.

ON BERNOULLI'S NUMBERS.

If $\frac{x}{e^x - 1}$ be expanded in ascending powers of x and the series be written in the form $B_0 + B_1x + B_2\frac{x^2}{2} + B_3\frac{x^3}{3} + \dots$, the quantities B_0, B_1, B_2, \dots are called Bernoulli's Numbers. Many functions can be expanded in terms of these numbers.

Denoting $\frac{x}{e^x - 1}$ by $f(x)$

$$\begin{aligned} \text{we have } f(-x) &= \frac{-x}{e^{-x} - 1} = \frac{xe^x}{e^x - 1} = \frac{x(e^x - 1) + x}{e^x - 1} \\ &= x + \frac{x}{e^x - 1} = x + f(x). \end{aligned}$$

Hence $f(x)$ differs from $f(-x)$ only in having an additional term x . Therefore $f(x)$ does not contain any odd power of x except x .

$$\therefore B_3 = 0, B_5 = 0 \text{ and so on.}$$

To find the expansion put $u = \frac{x}{e^x - 1}$.

$$\therefore e^x u = u + x.$$

Applying Leibnitz theorem we get

$$e^x \left[u_n + nu_{n-1} + \frac{n(n-1)}{2} u_{n-2} + \dots + u \right] = u_n$$

where n is greater than 1.

If however $n = 1$ we have $e^x(u_1 + u) = u_1 + 1, \dots, (1)$

Putting $n = 2, 3, 4, \dots$ We get the following sets of equations

$$e^x[u_2 + 2u_1 + u] = u_2 \quad \dots \quad (2)$$

$$e^x[u_3 + 3u_2 + 3u_1 + u] = u_3 \quad \dots \quad (3)$$

$$e^x[u_4 + 4u_3 + 6u_2 + 4u_1 + u] = u_4 \quad \dots \quad (4)$$

Putting $x = 0$ in (1), (2) &c. We get

$$(u)_0 = 1$$

$$2(u_1)_0 + (u)_0 = 0$$

$$3(u_2)_0 + 3(u_1)_0 + (u)_0 = 0$$

$$4(u_3)_0 + 6(u_2)_0 + 4(u_1)_0 + (u)_0 = 0$$

and so on

From these we get

$$(u)_0 = 1, (u_1)_0 = -\frac{1}{2}, (u_2)_0 = \frac{1}{6}, (u_3)_0 = 0, (u_4)_0 = -\frac{1}{30},$$

$(u_5)_0 = 0, (u_6)_0 = \frac{1}{42}, \dots$ &c., where $(u_{2m+1})_0 = 0$ for all positive integral values of m .

By the help of the equations (1), (2), (3) &c. We

can calculate the value of $(u_n)_0$ where n is any positive integer.

Now by Maclaurin's theorem

$$u = (u)_0 + (u_1)_0 \frac{x}{1} + (u_2)_0 \frac{x^2}{2} + (u_3)_0 \frac{x^3}{3} + \dots$$

$$\therefore B_0 = u_0 = 1$$

$$B_1 = (u_1)_0 = -\frac{1}{2}, B_2 = (u_2)_0 = \frac{1}{6}, B_3 = (u_3)_0 = 0$$

$$B_4 = (u_4)_0 = -\frac{1}{30}, B_5 = (u_5)_0 = 0, B_6 = (u_6)_0 = \frac{1}{42}, \dots$$

$$\text{Hence } \frac{x}{e^x - 1} = 1 - \frac{1}{2}x + \frac{1}{6}\frac{x^2}{2} - \frac{1}{30}\frac{x^4}{24} + \frac{1}{42}\frac{x^6}{720} + \dots$$

This result may also be obtained by Arbogast's Method of Derivations in the following manner :

$$\begin{aligned} \frac{x}{e^x - 1} &= \frac{x}{x + \frac{x^2}{2} + \frac{x^3}{3} + \dots} = \frac{1}{1 + \frac{1}{2}x + \frac{1}{3}\frac{x^2}{2} + \frac{1}{4}\frac{x^3}{24} + \dots} \\ &= \left(1 + \frac{1}{2}x + \frac{1}{3}\frac{x^2}{2} + \frac{1}{4}\frac{x^3}{24} + \dots \right)^{-1} \end{aligned}$$

But by Arbogast's method—

$$\text{if } u = a + bx + c\frac{x^2}{2} + d\frac{x^3}{3} + \dots$$

$$\phi(u) = A + Bx + C\frac{x^2}{2} + D\frac{x^3}{3} + \dots$$

where $A = \phi(a)$

$$B = \phi'(a).b$$

$$C = \phi''(a).b^2 + \phi'(a).c$$

and so on.

$$\text{Here } \phi(u) = u^{-1} \therefore A = a^{-1}$$

$$B = -a^{-2}.b$$

$$C = -a^{-2}.c + 2a^{-3}b^2$$

&c.

Putting $a = 1, b = \frac{1}{2}, c = \frac{1}{3}, d = \frac{1}{4}$ &c. the values of A, B, C, D &c. are easily obtained.

To expand $\frac{1}{e^x + 1}$ in terms of Bernoulli's Numbers.

$$\text{We have } \frac{x}{e^x - 1} - \frac{x}{e^x + 1} = \frac{2x}{e^{2x} - 1}$$

$$\therefore \frac{x}{e^x + 1} = \frac{x}{e^x - 1} - \frac{2x}{e^{2x} - 1}$$

$$= B_0 + B_1x + B_2\frac{x^2}{2} + B_4\frac{x^4}{24} + \dots$$

$$- \left\{ B_0 + B_1.2x + B_2\frac{(2x)^2}{2} + B_4\frac{(2x)^4}{24} + \dots \right\}$$

$$= -B_1x - B_2(2^2-1)\frac{x^3}{L_2} - B_4(2^4-1)\frac{x^5}{L_4} + \dots$$

$$\therefore \frac{1}{e^x+1} = -B_1 - B_2(2^2-1)\frac{x^3}{L_2} - B_4(2^4-1)\frac{x^5}{L_4} - \dots$$

$$\text{Again } \frac{e^x-1}{e^x+1} = \frac{e^x+1-2}{e^x+1} = 1 - \frac{2}{e^x+1}$$

$$= 1 - 2 \left[-B_1 - B_2(2^2-1)\frac{x^3}{L_2} - B_4(2^4-1)\frac{x^5}{L_4} - \dots \right]$$

$$= 1 + 2B_1 + 2B_2(2^2-1)\frac{x^3}{L_2} + 2B_4(2^4-1)\frac{x^5}{L_4} + \dots$$

$$\text{But } 2B_1 = -1$$

$$\therefore \frac{e^x-1}{e^x+1} = 2B_2(2^2-1)\frac{x^3}{L_2} + 2B_4(2^4-1)\frac{x^5}{L_4} + \dots$$

Put $2ix$ for x in this result

$$\text{We get } \frac{e^{2ix}-1}{e^{2ix}+1} = 2B_2(2^2-1)\frac{2ix}{L_2} - 2B_4(2^4-1)\frac{(2ix)^5}{L_4}$$

$$+ 2B_6(2^6-1)\frac{(2ix)^7}{L_6} - \dots$$

$$\text{But } \frac{e^{2ix}-1}{e^{2ix}+1} = i \tan x$$

$$\therefore i \tan x = i \left[2B_2(2^2-1)\frac{2x}{L_2} - 2B_4(2^4-1)\frac{(2x)^5}{L_4} + \dots \right]$$

$$\therefore \tan x = 2B_2(2^2-1)\frac{2x}{L_2} - 2B_4(2^4-1)\frac{(2x)^5}{L_4} + \dots$$

This gives the expansion of $\tan x$ in terms of Bernoulli's Numbers.

$$\text{Again } -i \cot x = \frac{e^{2ix}+1}{e^{2ix}-1} = 1 + \frac{2}{e^{2ix}-1} \text{ which can}$$

be obtained from the expansion of $\frac{x}{e^x-1}$ thus giving the expansion of $\cot x$.

To expand $\operatorname{cosec} x$.

$$\text{We know } \operatorname{cosec} x - \cot x = \tan \frac{x}{2}$$

$$\therefore \operatorname{cosec} x = \cot x + \tan \frac{x}{2}$$

Now the right side can be expanded in terms of Bernoulli's Numbers, giving the expansion of $\operatorname{cosec} x$.

The expansion of $\cot x$ as determined in the above manner would be found to be equal to

$$(\cot x) = \frac{1}{x} - B_2 \frac{2^2x}{L_2} + B_4 \frac{2^4x^3}{L_4} - B_6 \frac{2^6x^5}{L_6} + \dots$$

For x put πx and multiply both sides by π

$$\therefore \pi \cot \pi x = \frac{1}{x} - B_2 \frac{2^2\pi^2x}{L_2} + B_4 \frac{2^4\pi^4x^3}{L_4} \dots (A)$$

$$\text{Now } \sin x = x \left(1 - \frac{x^2}{\pi^2}\right) \left(1 - \frac{x^2}{2^2\pi^2}\right) \left(1 - \frac{x^2}{3^2\pi^2}\right) \dots$$

putting πx for x

$$\sin \pi x = \pi x \left(1 - \frac{x^2}{1^2}\right) \left(1 - \frac{x^2}{2^2}\right) \left(1 - \frac{x^2}{3^2}\right) \dots$$

Taking logarithms of both and differentiating we get

$$\begin{aligned} \pi \cot \pi x &= \frac{1}{x} - \frac{2x}{1^2-x^2} - \frac{2x}{2^2-x^2} - \dots \\ &= \frac{1}{x} - 2x \left[\frac{1}{1^2-x^2} + \frac{1}{2^2-x^2} + \dots \right] \end{aligned}$$

$$\begin{aligned} \text{But } \frac{1}{a^2-x^2} &= \frac{1}{a^2 \left(1 - \frac{x^2}{a^2}\right)} = \frac{1}{a^2} \left(1 - \frac{x^2}{a^2}\right)^{-1} \\ &= \frac{1}{a^2} \left[1 + \frac{x^2}{a^2} + \frac{x^4}{a^4} + \dots \right] \end{aligned}$$

Expanding the terms in brackets in this manner we get

$$\begin{aligned} \pi \cot \pi x &= \frac{1}{x} - 2x \left\{ \frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \dots \right\} \\ &\quad - 2x^3 \left\{ \frac{1}{1^4} + \frac{1}{2^4} + \dots \right\} \\ &\quad - 2x^5 \left\{ \frac{1}{1^6} + \frac{1}{2^6} + \dots \right\} \\ &\quad \dots \dots \dots \end{aligned}$$

Equating this with (A) We get

$$\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \dots = \frac{1}{2} \frac{(2\pi)^2}{L_2} B_2$$

$$\frac{1}{1^4} + \frac{1}{2^4} + \dots = -\frac{1}{2} \frac{(2\pi)^4}{L_4} B_4$$

$$\frac{1}{1^6} + \frac{1}{2^6} + \dots = \frac{1}{2} \frac{(2\pi)^6}{L_6} B_6$$

$$\frac{1}{1^{2n}} + \frac{1}{2^{2n}} + \dots = \pm \frac{1}{2} \frac{(2\pi)^{2n}}{L_{2n}} B_{2n}$$

Instead of taking the factors of $\sin x$, if we take those of $\cos x$, we get another series of similar results.

CO-OPERATION.

Co-operation means union among individual persons to do by their concerted action what they cannot do by their individual uncombined action : it means organised effort.

What is Co-operation ?

The prophets of social reform had denounced the antagonism of interests in existing societies as the root cause of the evils to be removed.

Stages in the development of co-operation.

Their efforts were first directed to the work of relieving purchasers from the increase of costs and from the various forms of Fraud which they have to suffer from at the hands of the retail-dealer. In this their attempt we find the origin of the Distributive Store. I.

II. The second step was to obtain from the original producer the necessary commodities instead of getting them through the whole-sale dealer.

There is no real difference between the first and second stages.

III. The third step, recently taken, is the system of cooperative banking. In Germany under Schulze Detitzsch, cooperative banks have become quite a power in the State.

IV. The fourth step is cooperative production. Here a new element, labour, comes in, and requires to be harmonised. In the distribution Society the problem is confined to harmonising the conflicting interests of the capitalist and the purchaser : and it has been solved by inducing the purchaser to supply his own capital and sell to himself. But in productive cooperation the problem necessarily includes the claims of labour.

Attempts at solving this problem.

Attempts at simplifying this problem have been made from opposite sides.

(a) The workers have attempted, especially in France, to find their own capital, leaving the purchaser out of the alliance altogether,

(b) A theory, as yet not applied to practice on any considerable scale, has been proposed, by which the purchasers are to apply the capital needed to manufacture articles for their own supply, calling upon the labourers to sink their claims to profits as workers in the benefits which they may obtain as purchasers, from the Societies of which they are members.

Neither seems an adequate solution. In the one the interests of the purchasers, and in the other, of the workers, are lacking. This may be obviated by uniting the distributive society, through the medium of the great wholesale centres of distribution, with the productive society. How this can be effected, we shall discuss as we go on.

Inadequacy of the solutions, their defects.

The pecuniary advantages may seem to be the chief benefit that a member of a cooperative society enjoys.

But these advantages in themselves are very little. The uses to which they may be put, the increase in the material, moral and intellectual conditions of the members are the real benefits of cooperation. Goods of unquestionable quality, no fraud in weights and measures, cash transactions and the consequent fewness of bad debts and cheapness of prices, these are among the benefits that cooperation affords. Cooperation enables and induces us to be thrifty. The public libraries, news rooms and evening classes are the most valuable educational adjuncts of the cooperation store. Cooperation is a true cure for poverty. It affords administrative and business training. Many a man, hoping to be a member of a Cooperative Society, has given up drinking and other noxious habits. Co-operation teaches men the necessity for, and the power of, unity.

Benefits of co-operation

Competition has greatly debased trade morality. Advertisements declaring everything to be the best, the cheapest, and the most effi-

Cooperation can remedy the evils of competition.

casious; rival men and companies resorting to numerous unfair means to outbid one another, and to overreach customers and consumers in all possible ways that human ingenuity is capable of devising. This debased trade-morality has also contaminated society, politics and even religion itself. Sham companies, sham prospectuses, sham everything. It is cooperation alone that can remedy this regrettable state of things by insuring trade-morality. Cooperation will show you how to do good to your neighbour without the least self-sacrifice.

The benefits of cooperation being so many, and so valuable, the question is, how best to carry it out among those most in need of it, namely among the poor rural population.

How to carry out cooperation among the poor village population.

A large part of the poor of every country, and millions of the helpless and illiterate people of India, might perhaps be reached by a mere increase in the propagandist activity of every cooperative society or store. Every such body should have a standing propaganda committee whose function it should be to make known the advantages of such a body to people around it. But cooperative stores are things which, despite all propaganda work, will obtain very little footing in villages, at any rate in the beginning, because they would not be attractive enough, and because they give no credit even in the cruelest winter. A reading room should rather first be opened in a village, and after the villagers are taught the principles and practice of co-operation, and made to feel some interest in it, the reading room may be developed into a store. A room in the village, used as a drawing room, or an entertaining room, may excellently serve the purpose. Here the assembled people should be provided with instruction and recreation. Once convert some, and they will

soon learn more serious reasons for remaining there.

Village people in all countries are, to a considerable extent, agriculturists; and the Indian rural population especially depend upon agriculture as their main support. Our aim next should therefore naturally be to see what co-operation can do for the agrarian interest in a country.

The following are the special advantages which agriculture may receive from co-operation.

- (1) The collective buying of manure, seeds, machines and all other things used in agriculture,
- (2) The collective sale of agricultural produce,
- (3) To facilitate work by the use of machines purchased and owned collectively.
- (4) By the establishment of co-operative banks to obtain credit on the best terms.
- (5) A better organisation for effecting the various insurances against loss.

In all countries where cultivation is carried on by small holders, the conditions are peculiarly adapted for the extension of cooperative effort. On the other hand where cultivation is almost entirely in the hands of the large farmer, employing the labour of others, cooperation is not only difficult to practise, but is of little value to the bulk of those who are dependent on agriculture for their support. What is wanted is cooperation in obtaining land for cultivation, in supplying improved methods of production, in obtaining and disseminating the best information and knowledge in improved culture, etc. The position of the worker must be made more attractive and remunerative; and in order to do this effectually each agricultural worker who is the head of a family, should

Special facilities for, and desirability of, establishing cooperative societies among small holders.

become an agriculturist on his own account, having his own lands to cultivate. In the large manufacturing industries the labourer is required mostly to tend the machine, and if he does this with proper attention, good results will naturally follow. But in cultivation it is more essential that the worker would be thoroughly in sympathy with the work and in love with the field. It is essential therefore that each cultivator should have as much land as he can properly manage. The plan of having large farms, whether owned by capitalists or by cooperative societies, does not tend to develop the knowledge or the character of the hired labourer. But let that same labourer realise that he has some fields to use for himself, and that the results will depend on his own activity and skill, the producing power of the fields will be largely increased,

This individualistic effort can be carried on consistently with cooperative ideas by insuring cooperative ownership of the land, cooperative purchasing of all requirements and cooperative sale of all produce. Wholesale societies should become the depositories of the surplus capital of the cooperative movement, and they should invest this capital in the purchase of land.

Having got together the labourers (who should be already trained for the work), and having land in the possession of the wholesale societies as the cooperative landlords we then require to band these individuals together as a society of small holders, so that as a corporate body they would be able to rent the land they require, to advantage, and to give security to the landlord which the individual could not. The small holding society should then let to its members the land which each required for cultivation. The advantages of such a small-holding society making its purchases and sales in common have already been mentioned. Then a moderate amount of capital would be required by each cultivator; this capital could

easily be raised by the small holding society itself on the security of its membership or by means of cooperative credit banks.

A cooperative union is the organisation of the cooperative societies throughout a country appointed to administer the affairs of the central movement. For facility of work a country should be divided into districts, and local management of affairs should be placed in the hands of the local members; but the general direction of the whole body should be in the hands of a Board. Union, which is strength to all causes, is to the cause of cooperation, life itself. Young societies, unconnected with any central board, have to pass through many difficulties; may have to suffer from ignorance of business precautions; they have to learn every lesson by dear experience. A locality desirous of opening a society may find it not so easy to give effect to its wishes; but a cooperative union can do this for it quite easily. The union is the best medium of communicating advice on well-trying business-methods. It is in a position to publish periodicals and pamphlets for the guidance and information of the local bodies, and it is the only agency to influence the legislature of a country in their favour. The co-operative union is the only institution to inculcate mutual forbearance among the societies, and affiliation with the co-operative union secures stability to them.

To obviate competition, overlapping and friction among unorganised individual societies, they must be amalgamated to form a co-operative union. A further strong argument in support of the principle of amalgamation is the distribution of commodities by large syndicates and trusts whose transactions are gigantic, and which are opening branches in almost every place of importance. The small societies amalgamated will be enabled to withstand their competition.

The central union.
its necessity, and
its advantages.

Cooperative
production.

A most difficult problem to solve is the relation between employers and employed; and co-operative production; if it can be conducted on sufficient scales, can be the most direct method of arriving at such a solution. The chief aim of productive co-operation should be to make every co-operator a capitalist, and enable him to become his own employer through profits. The workers should have control of the capital that employs them. This will abolish the necessity for strikes, and other industrial conflicts.

The Rochdale Pioneers have taught us how to advance from distributive to productive co-operation by utilising the profits of the store. The wholesale might undertake the work of production, localising industries in the districts most suited for them; the very best men should be procured as managers; and the employees should be interested in the welfare of the business in some form or other. But the great stumbling block to the progress of co-operative production is the difficulty of securing entrepreneurs or managers as efficient and as responsible as are to be found in industries carried on by single men.

Let us now turn to the condition of India.

The case of
India.

The size of the article has been already much increased, and I should now cease dwelling on her present sad economic condition. India's economic improvement to be thorough, must be begun in the village. A cooperative concern in every village, embracing both productive and distributive cooperation, should be, as far as practicable, started in every village. This will be something like the old village community reformed to suit the new conditions. The village stores in a district may combine to open a central store in the principal trading place of the district. These district stores may similarly combine and establish big wholesale

concerns in the chief commercial centres of the country, and thus facilitate exchange between the different districts. Our villages require, besides, cooperative credit societies and dharma-golas which may be of immense use in relieving the chronic indebtedness of our agriculturists, saving villages from frequent visitations of famine, and solving the problem of mass education by financing vernacular schools out of their reserve funds. They may thus indirectly improve the sanitation of the villages, and save millions annually from the jaws of malaria and other diseases.

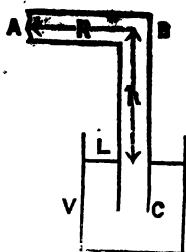
K. N. BHATTACHARJEE.

ON A METHOD OF RAISING WATER FROM A LOWER TO A HIGHER LEVEL.

While experimenting with a syphon consisting of a piece of rubber tubing about 3 or 4 feet long, it occurred to me that, if the outer limb of the syphon be held by the hand about its middle and whirled rapidly while it be raised gradually above the level of the water in the vessel, we should expect that water would still run out of the tube. I tried the experiment and found to be true what I anticipated. So the syphon was converted into an arrangement by which water was raised from a lower to a higher level. The theory of the experiment

may be best studied with the help of the accompanying diagram.

Let ABC be a bent tube of uniform bore, the arm BC of which dip vertically in a vessel V containing water. The other arm AB which makes a right angle with BC remains horizontal. Let R be the length of the arm AB and h be the length of BC lying above the surface L of the water in the vessel.



Let us suppose that both the limbs of the tube are filled with water. Let M be the mass of water contained in AB and M' the mass contained in BC . Then while the tube is at rest, motion of water in BC in a downward direction ensues also in consequence of which motion of water in the limb AB takes place from A to B . The force which causes this motion is evidently equal to the weight of the water contained in the portion BL of the arm BC which is equal to $M'g$.

Now if the tube be rotated about the axis of BC as axis of rotation, the water contained in the arm AB will experience a force which will tend to move it from B to A . So the mass of water contained in AB is acted on by two forces, one of which, namely, $M'g$ tends to move it from A to B while the other tends to move it the other way, and motion takes place either from A to B or from B to A according as the former becomes greater or less than the latter. If the forces be equal no motion ensues.

The latter force is calculated as follows:—
Let ω be the angular velocity of the arm AB which we may suppose to be divided into a many large number n of equal segments of length or thickness t so that $nt = AB = R$. Let m be the mass of water contained in each segment. And let $t_1, t_2, t_3, \dots, t_n$ be distances of the segments respectively from the axis of rotation. Then the force which the mass of water contained in AB experiences is

$$\sum m\omega^2 t = m\omega^2 \sum t^2$$

Now since t_1, t_2, \dots, t_n are equal to $t, 2t, 3t, \dots, nt$ respectively

$$\sum t = \frac{n(n+1)t}{2} = \frac{n^2 t}{2} + \frac{nt}{2}$$

$$\text{Hence the force} = \frac{m\omega^2 n^2 t}{2} + \frac{m\omega^2 nt}{2} =$$

$\frac{MR\omega^2}{2}$ neglecting the other term which is infinitely small.

$$\text{Since for no motion, } \frac{MR\omega^2}{2} = M'g$$

$$\text{or } \omega^2 = \frac{2M'}{MR} \cdot \frac{h}{R^2}$$

$$\text{or } R^2 \omega^2 = 2gh$$

$$\text{Therefore } V^2 = 2gh$$

where V is the Velocity of the end A of AB .

Hence no motion ensues when the end A of AB has a velocity equal to that which a body acquires in falling freely from position of rest under the action of gravity, through a height equal to h or the portion of BC lying above the level of water in the vessel.

When V becomes greater than $\sqrt{2gh}$ motion of water takes place from B to A in AB and C to B in BC and so water flows out of AB continuously provided BL or h does not exceed the barometric height of water, in which case no motion of water takes place along BC from C to B .

J. Roy.

STUDENTS' SECTION

A VISIT TO THE KANHERI CAVES.

[These caves are situated on the Salsette Island about 27 miles north of Bombay. They are believed to be the refuge of Buddhists at the time of Sankaracharya. The scenery around reminds one of Scott's description of the Trosachs in the Lady of the Lake.]

The train left the Grant Road Station,

taking us to Andheri where we got into another train and reached Borivli Station about 24 miles from Colaba. Here we got down and at once began our journey. In about ten minutes we were walking past the first and also the last village for no other did we meet with in a trip covering no less than six miles. On crossing the village we came to a spot where the road divided into two directions. We thought it prudent to follow the one which seemed more frequented. Passing through a forest we crossed a small rivulet and came to a hilly road. Here we were much relieved by the constant mild breeze and after a good hill climbing were ascending the stairs leading to our destination—Kanheri Caves.

There we sat on the bare hill to partake of of the scanty refreshment we had with us, all the while cherishing the mild breeze flowing incessantly, and not throwing into oblivion Alexander Selkirk's "I am monarch of all I survey." We next drank at one of the fountains cut out of the solid rock as to clearly exhibit the skill and fore-thought of the excavators. We felt ourselves completely enlivened at the sight of the neighbouring hills capped with newly verdured trees on which the dew still hang to glitter in the hot rays of the advanced sun. We then paced all about the hill and sent an inquiring glance at each of the hundred and eight caves, each with a fountain by it. Besides these, there we saw about as many more, which are either left unfinished or appear so because of the unceasing toil with which Nature labours on everything earthly. However, we could not but feel ourselves proud of being born in a country where such men lived and worked their days out: men, who caring little for themselves were busy workers for those whom they anticipated to come after them; men, who were great in everything that required human skill and ingenuity; men, whose memory make us revere and think more and more of them as we behold and appreciate

the relics they have left behind throughout the country.

Of all the caves, two are very large,—one with two huge statues of Buddha on either side of the entrance, and the other engraved with numerous small figures of the same great sage and supplied with two seemingly private chambers on either side of the hall inside. Some of these figures are difficult to be identified with the same sage, owing to the restless activity of some jovial fellows, who, while they happen to go there, practise their guns—though forbidden—with these as their targets.

While standing on the easternmost edge of the hill, I was frightened at the sight of the steep, dark and dreary dale below me. I came back to the middle or the highest part to see above me the unbounded sky dazzling with clear and bright sunlight and to get a bird's eye view of the country around the naked hill below, the row of black and low hills shadowed by thick clusters of bamboos a little to the right, the tempting lake "Tulsi" of the Bombay water-supply fame lying low amid crags far to the left, the calm sea kissing the sky off to the front, and the highest peak of the place adorned with newly-leaved palashas and other plants of the season shadowing its sides.

Thus was it that I had the pleasure or perhaps the good fortune of passing a day amid the relics of India's ancient art which are scattered all over the country in places with such varieties of scenes as it would be impossible, even by the best artist to paint them in the colour which it has pleased the Great Almighty to arrange in order, and form to suit the lands and climates, and to ensure whatever peace, happiness and comfort. His beloved children of this frail earth could make out of them.

D. N. BHATTACHARJI.

Bombay.

PROBLEMS

[N.B. This section will be devoted to problems in MATHEMATICS and other subjects. Readers are invited to send in solutions as also new problems.]

MATHEMATICS.

7. (E.T.) Solve $x^x = 100$, other than graphically.

8. (C.U.) Two heavy rings slide on a fixed smooth parabolic wire whose axis is horizontal, and the rings are connected by a string which passes over a smooth peg at the focus. Prove that in the position of equilibrium the depths of the rings below the axis of the parabola are proportional to their weights.

9. (L.U.) The external bisector of a triangle ABC meets BC produced in D . E is the middle point of BC , and a line through C parallel to AE meets AB produced in F . If EG is drawn parallel to DF to meet AB in G , prove that $AG = AC$.

10. (C.U.) The ends of a uniform inextensible string are attached to two fixed points and the string hangs freely under the action of gravity; deduce the equation of the curve in which it hangs. Given two smooth pegs in a horizontal line find the least length of a uniform inextensible string which will rest over them.

11. (M.A.) Draw through a given point in the plane of two given parallel straight lines, a line parallel to them making use of the ruler only.

12. (M.A.) If I be the in-centre and P the orthocentre of the triangle ABC , prove that $IP^2 = 2r^2 - 4R^2 \cos A \cos B \cos C$.

13. (N.) If ABC be a triangle having each side a quadrant, O the pole of the inscribed circle, P any point on the sphere then $(\cos PA + \cos PB + \cos PC)^2 = 3 \cos^2 PO$.

14. (B.) Find the sum of:—

(i) $\frac{1}{1.5.7} + \frac{1}{3.7.9} + \dots$ to n terms

(ii) $\frac{1}{10} + \frac{8}{10.15} + \frac{8.11}{17.15.20} + \dots$ to infinity.

REVIEWS.

The Chief Elizabethan Dramatists. Edited by Prof. W. A. Neilson Ph. D. (London: Cassell & Co.). Price 10s. 6d. net.

In this volume the author has dealt with a selection of thirty plays by Elizabethan dramatists, his objects being to illustrate Shakespeare by means of typical examples of the work of his contemporaries and to present in a single volume the most distinguishing plays of the Elizabethan period. The book gives the average reader a chance of being acquainted with dramatists such as Beaumont, Fletcher, Kyd, Massinger, Marlowe, Ford and others.

My Vagabondage: being the Intimate Autobiography of a Nature's Nomad. By J. E. Patterson. (London: Wm. Heinemann). Price 8s. 6d. net.

The author divides the book into two parts (1) The life Rebellious and (2) The Life Adventurous. The author's youth is a story of revolt of desperate courage and resentment of frequent escapes in hope of more congenial treatment and of such a series of thwackings as would have embittered the brightest of spirits. The second part contains the author's adventures at sea. Mr. Patterson's life is certainly as far removed as possible from the humdrum prose of ordinary existence. The Book is a human document of great interest.

The Student's Froebel. By William H. Herford B. A. (London: Sir Isaac Pitman and Sons). Price 2s. 6d. net.

All who are interested in the education of the very young would find in this volume a very useful publication. The extraordinary knowledge of the child possessed by Froebel constitutes a phenomenon in the history of education. This new edition will be warmly welcomed by teachers for they would derive much benefit from the careful study of Froebel's principles and methods.

The changeful Earth: an Introduction to the Record of the Rocks. By Grenville A. J. Cole. (London: Macmillan & Co.)

A pleasantly written introduction to the principles of physical geology. It deals with the subject matter in a style very different from that of the ordinary text-books.

Intermediate Logic. By J. Welton M. A. and A. J. Monahan M. A. (London: Univ. Tutorial Press). Price 7s. 6d.

This book is based on the Manual of Logic by Mr. Welton which is used by our Intermediate Students as a useful book. This book therefore having been based upon so successful a previous work would certainly be invaluable to the large class of Intermediate Students of Indian Universities, who were long in need of a book suitable for this purpose.

School Algebra Part II. By H. S. Hall. (London: Macmillan & Co.) Price 1s. 6d.

Begins with Progressions. Together with Part I it may be useful to our *Matriculation Students*.

Sanskrit Learning in Bengal. By Professor Vanamali Vedantatirtha, M. A. of the Gauhati College. (Calcutta: Bhattacharjee & Sons, 1910). Price 8 as.

A pamphlet which compares the *Tol* system of Education with the modern system as also it touches on the different methods of learning Sanskrit Grammar, e.g. *Panini, Siddhanta Kaumudi, Mugdhobodh*. These together with several other criticisms and suggestions regarding the study of Sanskrit Literature, Philosophy, Sciences etc. make the essay interesting and useful.

SCIENCE NOTES

AND

OTHER INTERESTING MATTERS.

INVISIBLE AIRSHIPS.

The new form of airship from which explosives may be dropped at no very great height has practically no chance of retaliation: although if it is longer than the great ship "Olympic" it will, at a height of 1,500 feet, be detected with great difficulty and at 3,000 feet—much less than a mile—will be absolutely invisible. The inventor is Baron Adam Roenne, well-known in England as an airship and naval engineer. The main principles upon which the invention is based is the equalisation of light and shade. The cover

or envelope of the airship is made of chromium, a metal possessing a highly-polished surface which is perpetually retained by a covering of transparent varnish. Therefore, the metal is equivalent to a mirror, and it is by reflection that the invisibility is obtained. The surface and sides of the polished envelope naturally must reflect the same colour—bright or murky, according to the weather—as its environment, and thus be invisible. It is with the lower part of the polished balloon, which reflects the earth in its mirror that the main difficulty of the invention was encountered. Being darker than the sky, the reflected earth must cause this part of the huge envelope to stand out prominently in the lighter atmosphere. This difficulty is overcome by making the sides of the keel, which is to be as long as the balloon, also reflecting mirrors, and by placing on the keel triangular longitudinal ribs. With the aid of these ribs, the keel reflects the shades of the air on to the lower part of the balloon above, and thus obliterates the reflected darkness of the earth. In other words, it equalises light and shade. So that there will be no recurring shade shown on the bottom of the keel; this will taper to a point. By this means the airship will always take the colour of its surrounding elements, and be invisible. The device has been submitted by the inventor to the officials of the Greenwich Royal Observatory, who declare that it is thoroughly scientific and certainly practicable.

WIRELESS IN THE NORTH.

The erection of the large wireless station on Spitzbergen recently decided upon by the Norwegian Storting is being carried out with the greatest activity, so that wireless connection with Spitzbergen may be an accomplished fact before the close of the year. The installation will be on the "Telefunken" system, and the apparatus and accessories will be supplied by the Allgemeine Elektrizitäts Gesellschaft, of Berlin. The

two masts erected at Spitzbergen and Hammerfest respectively will be 60m. high: the iron-work tower at the great station at Nauern, near Berlin, is 100m. high. The new stations, as do all in Norway, belong to the state. A steamer, with building material, engineers and workmen, has already left Christiania for Spitzbergen. In view of the comparatively short time in which constructive operations are possible on Spitzbergen, the Norweign Telegraph Department, as well as the various manufacturers, is working at high pressure. The Spitzbergen station is situated at Green Harbour, at the entrance to the Eisfjord, where a whale fishing station is located.—*Zeitschrift fur Seewesen.*

NEWSPAPER PRESS.

The total number of newspapers published in the entire world comprises upwards of 6,000 dailies, of which over 900 are credited to Germany and 250 to Great Britain. Paris alone has 150—more than London, New York, Philadelphia, and Boston added together. *Le Petit Journal of Paris* has the largest circulation in the world; but the native dialect papers of India have the greatest number of readers, because they are circulated until completely worn out. The *Post Zeitung of Frankfort*, Germany, is the oldest newspaper in Europe, but in China the *Kin Pan* is a thousand years old, and the *Tsing Pao*, or *Peking News*, is the oldest newspaper in the world, having been regularly published for nearly 1,400 years. Its circulation is about 10,000.

PROFESSOR BELL'S LATEST DISCOVERY.

A correspondent who has recently come from America, where he had the privilege of a long conversation with Professor Bell, writes to the "Scotsman" that he found the famous scientist hopeful on the verge of another great discovery. Hearing, he argues, is nothing more than the result of vibrations of sound beating

upon the drum of the ear. These are communicated to the brain by a series of nerves. Deafness is a defect in this means of communication. A person can hear perfectly through his teeth, as is commonly demonstrated by placing one end of a pocket-knife in the mouth and the other end on a piano. It is equally easy to communicate sound-waves to the brains through any other bony substance, even the skull itself. Advancing from these premises Professor Bell is constructing an apparatus which, attached to the head, will gather in the sound-waves like the transmitter of the telephone, and repeat what they say to the skull, which will convey the information to the brain which lies beneath it.

AERO-PHONE.

The latest development in connection with the aeroplane is the aerophone, an apparatus embodying a new system of wireless telephone, invented by Mr. H. Grindell-Mathews. According to a published report a completely successful demonstration of the new invention was given on Saturday 7th at Cardiff by the inventor, in conjunction with Mr. B. C. Hucks, the well-known monoplane pilot. Ascending with one of the Mathews receivers to a height of 700ft., Mr. Hucks easily succeeded in hearing Mr. Mathews' verbal message, although a strong breeze was blowing and he was travelling at the rate of fifty miles an hour. It is said that the apparatus is small and portable, that it needs no skilled interpretation, and that the distance over which it can operate is practically unlimited. The result of further and official trials of the invention will be awaited with great interest, more especially in military quarters.

ECONOMIC MOTORING.

As an instance of what can be done in the way of economical motoring, a case cited in the "Motor" is both interesting and instructive to

the would-be motorist whose means or leisure is limited. The car in question, a 1906 model of British make (6 h. p.), was bought second-hand in 1907, after it had already done about one thousand miles, for £80. Its original price would be about £130. Like the majority of motorists, or prospective motorists, the owner was only able to use it on occasional evenings during the week, for week-ends, and for the annual holiday. But it has been consistently used on all such occasions, and it has not had a single breakdown of any consequence. Since 1907 up to date, it has averaged about 1,700 miles per annum, and the total cost of upkeep has been about £70, which works out at about £17 per annum, or seven shillings per week. Of course the owner both drove and looked after the car himself, and no doubt drove on all occasions with a due regard to economy in tyres and petrol. Probably, also, he had the advantage of previous experience in motoring and was able, therefore, to get more out of the car than a novice could expect to do. But in any case these figures cited, which come from an authentic source, show conclusively that a very fair amount of motoring can be indulged in at a much lower cost than is generally supposed:

THE ORIGIN OF NEW STARS.

In the current number of "Knowlege", Professor Bickerton discusses the fascinating subject of New Stars with special reference to Nova Persei, the temporary star which blazed forth in the constellation Perseus at the beginning of the present century. "Nothing in the whole realm of Nature," says Professor Bickerton, "is so wonderful as this event, the bursting out of a giant sun, it is then increasing with amazing rapidity until it is some times many scores of thousands of times the brilliancy of the magnificent luminary that keeps the earth in its orbit." Briefly the explanation of such phenomena is the collision of suns. Two dark bodies

approach one another with enormous velocity and collide in a tangential or grazing manner. A part is torn from each and forms a third body. Intensely heated by the force of contact, this blazes up into the new star. The original masses pass on their way with motions altered by the contact. Expanding, and at first increasing in brilliancy, the new star as it further grows becomes invisible to the naked eye as a nebula.



FOOTBALL.

SIMLA. Durand Football Tournament. Results.

FIRST ROUND. (1) Royal Scots beat 2nd Royal Fusiliers (3-0). (2) King's own Scottish Borderers beat West Ridings (0-0, 0-0, 3-0). (3) 5th Mountain Battery beat East Yorks (4-2). (4) Lancashire Fusiliers beat King's own Lancashire Regiment (5-0). (5) Gordon Highlanders beat 3rd King's Royal Rifles (1-1, 1-0).

SECOND ROUND. (1) Highland Light Infantry beat Roorkee Artillery Brigade (4-0). (2) Black Watch beat 13th Hussars (4-1). (3) Royal Welsh Fusiliers beat Simla Volunteers (0-0, 5-1). (4) Royal Irish Rifles beat king's Liverpools (1-1, 4-1). (5) Royal Rifles beat South Lancshires (0-0, 3-1). (6) Royal Scots beat N. W. Ry. Volunteers (4-2). (7) Fifth Mountain Battery beat King's Own Scottish Borderers (2-0). (8) Lancashire Fusiliers best Gordon Highlanders (2-0).

THIRD ROUND. (1) Blackwatch beat Highland Light Infantry (2-1). (2) Royal Welsh

Fusiliers beat Royal Irish (1-0). (3) 4th King's Royal Rifles beat Royal Scots (2-0). (4) Lancashire Fusiliers beat 5th Mountain Battery.

SEMI-FINALS. (1) Blackwatch beat Royal Welsh Fusiliers by the big margin of 4 goals to love. Throughout the game the Blackwatch had the upper hand. Three goals were scored during the initial half the fourth and the last goal being netted after a brilliant display of football close towards the call of time.

(2) The second match in the penultimate stage of the tournament, was between the Lancashire Fusiliers and the 4th King's Royal Rifles in which the Fusiliers came out victorious, (2-1). Credit should be given to the Rifles, who were all fast runners and often outran their opponents.

FINAL. The final game was decided on Monday the 9th October after another day's game resulting in draw, between the Blackwatch and the Lancashires, who met once more and gave a splendid display of football before a large and influential gathering. The game was not so fast as on the last occasion, so after a slow game the first half ended without any score. The second half opened with the Blackwatch having the upper hand, and Watson, the inner left netted with a beautiful shot amidst uproarious cheering. The Fusiliers then put on a spurt but without effect and Egerton the inner right of the Blackwatch tried a swift shot which was cleverly scored. Five minutes before full time the Lancashires forced a nice corner and all but scored. The game thus ended leaving the Blackwatch winners of the Cup. Her Excellency Lady Hardinge gave away the prizes. The Blackwatch won the Durand Cup last time in 1899 and were runners up in 1904.

BOMBAY. Rovers' Cup Tournament. Results.

FIRST ROUND. (1) York and Lancashire Regiment beat Dublin Fusiliers (*scratched*). (2) Royal North Lancashires beat Bombay Football Club (1-0).

SECOND ROUND. (1) Dorsetshire Regiment beat Bombay Gymkhana (7-0). (2) Royal Warwicks beat R. G. A. (3-0). (3) Durham Light Infantry beat York and Lancs. Regiment (2-0). (4) Royal North Lancashires beat 10th Brigade R. F. A. Kirkee (0-0, 2-0)

SEMI FINALS. (1) Royal Warwicks beat Durham Light Infantry (1-0). (2) Royal North Lancashires beat Dorsets (3-1).

FINAL. Royal Warwicks beat Royal North Lancashires (1-0). Mr. Vaughan presented the Cup and medals and also the Harwood League Cup to the Warwicks. The Leslie Cup for the sprinting competition won by the Durhams was also presented.

Triangular Football in Bombay.

The first of the charity matches in aid of the projected Union Jack Club was played at the Cooperage, between the representative Military and Naval combinations, a fast and exciting game resulted in a win for the Military team by the narrow margin of a goal to nil. The second match was played between the picked civilian team and the Military combination. The Military team was composed of Royal Warwicks and R. G. A. Colaba and the Civilians were a team picked from the Bomby Gymkhana and Bombay F. C. The game was all along up and down each goal being attacked in turn. The Military men won by a goal to love. The cup is a present of a gentleman who desires to be known as 'A sympathiser of the object.'

POONA. Divisional Football Tournament.

The final of the Tournament, which also decided the team destined to represent the division in the Delhi Tournament, was played between the Royal North Lancashires and the Dorsets, in which the former defeated the latter by the big margin of three goals to one.

CALCUTTA.**L. M. S. College (old Boys) vs. Central College.**

The two College teams met in the final round of the Bankim Challenge Shield, on the National ground when the game resulted in a win for the L. M. S. College boys by the big margin of 4 goals to nil. After the game Mr. Wyness very kindly presented the Shield and Medals to the winners and one medal to the runners up.

RUGBY.**MADRAS. Rugby Tournament.**

Madras vs Calcutta. This opening game of the tournament attracted considerable attention. Both teams were well matched and when half time was called no score was made. On resuming Madras pressed and scored a magnificent goal amid great applause. Calcutta bucked up but their halves and three quarters were out-classed and Madras eventually won by 11 points to nil.

Bombay vs. Liecester Regiment (A). This game in the semi final round resulted in a win for the Military team by 18 points. The Liecesters were the heavier team and controlled the scrum and their passing was better. Bombay played against a strong wind in the first half and had one man hurt just before half time.

Madras vs. Liecesters (B). Madras beat the second string of the Liecester Regiment by 3 goals and by 18 points to nil.

Final.—The final game between the Madras Gymkhana and Liecester Regiment, which though played at a strenuous pace all through, was productive of no result, on the first occasion, and even after extra time resulted in draw. In the replayed game the Madras Gymkhana managed to beat the Military team by 3 tries to nil.

HOCKEY.**BANGALORE. Durbar Hockey Tournament.**

The team of the 1st Brahmins from Secunderabad won the divisional final of the Delhi Durbar Hockey Tournament from the 20th Deccan Horse by two goals to love after beating the 2nd Sappers and Miners and the Pioneers at Secunderabad last week thus becoming the representative team from the 9th division for the Delhi Tournament. To-day's game was played on the Gymkhana ground, exciting much enthusiasm.

RANCHI. Maharaja Cup Tournament.

The final of the above tournament, under the auspices of the Chota Nagpur Divisional Hockey Association of the Bengal Hockey Association, was played between St. Mary's Roman Parish (Holders) and St. Paul's School, when the game resulted in a victory for the St. Paul's by two goals to nil.

CRICKET.**BOMBAY. Triangular Cricket.**

The Parsees won the Triangular Contest after defeating the Hindus by nine wickets and the Presidency by eight wickets.

THE HINDUS.

First Innings.		Second Innings.	
S. K. Diveker, b Warden ...	0	c Oomrigar, b Parekh ...	8
P. Balu, b Bulsara ...	9	b Bulsara ...	30
Oghad Shanker, c Chotia b Warden ...	0	1-b-w, b Parekh ...	1
P. Shivram, c Pavri, b Warden ...	5	c Warden, b Parekh ...	0
C. V. Mehta, c Parekh, b Warden ...	19	c Mulla, b Bulsara ...	3
K. A. Date, b Bulsara ...	18	Absent ...	0
Deodhar, b Warden ...	2	c Parekh, b Warden ...	5
P. Vithal, b Warden ...	1	not out ...	62
L. Sempre, c Pavri b Warden ...	1	c Mulla b Warden ...	4
K. Seshachari, not out ...	8	run out ...	2

P. Erasha, l-b-w, b Pavri	...17	c Chothia, b Bulsara	... 1
Extras	... 2	Extras	... 5
Total	...81		121

THE PARSIS.

First Innings.		Second Innings.	
M. D. Oomrigar, c Date b Balu	... 12	not out	... 8
D. K. Kapadia, run out	... 3	c Sempre b O. Shankar	... 9
D. D. Drive, not out	... 42	not out	1
F. P. Colabawalla, c Sempre b Balu	... 20		
S. M. Chothia, b O. Shunker, b Balu	... 58		
J. S. Warden, b Balu	... 5		
H. F. Mulla, c Vithal, b Balu	... 20	Did not bat.	
Dr. M. E. Pavri, c Sempre b O. Shanker	... 11		
M. D. Bulsara, c Shivar, b O. Shanker	... 1		
M. B. Wacha, c Diveker, b O. Shanker	... 0		
Extras	... 9	Extras	2
Total	...148	Total	— (for 1 wkt) 20

THE PRESIDENCY.

First Innings.		Second Innings.	
E. E. Christie, c Chothia, b Bulsara	... 6	c Chothia, b Warden	... 2
T. H. Watts, c Driver, b Warden	...20	c Mulla, b Warden	6
F. R. B. Brooke, b Warden	...14	c Kapadia, b Warden	4
H. L. Simms, c Parekh, b Warden	... 6	c Meherhomji, b Bulsara	...10
Capt. E. T. Tillard, b Bulsara	...15	c Mulla, b Warden	10
Major J. G. Greig (capt.), not out	...22	c Warden, b Bulsara	... 9
V. E. Purcell, c Kapadia, b Bulsara	... 0	not out	...29

K. E. Cooper, c and b Warden	... 0	c and b Bulsara	... 8
W. S. Halliley, c Warden, b Bulsara	... 5	c and b Bulsara	... 1
J. S. Milne, c Chotia, b Warden	... 6	c Bulsara, b Warden	...16

Major W. M. Southey, c Pavri, b Warden.	0	c Madon, b Warden	... 0
Extras	... 1	Extras	... 0
Total	104	Total	95

PARSIS.

First Inning		Second Innings.	
D. D. Driver, b Cooper	7	c Cooper, b Simms	0
D. K. Kapadia, c Milne, b Simms	... 1	not out	...10
S. M. Chothia, c Southey, b Cooper	...24	c Brooke, b Simms	0
J. S. Warden, c Brooke, b Simms	... 8	not out	...12
F. P. Colabawalla, st Brooke, b Simms	...39		
Dr. M. E. Pavri (Capt.) c and b Cooper	...31		
R. P. Meherhomji, c Milne, b Watts	...25		
M. D. Parekh, st Brooke, b Simms	... 6	Did not bat.	
H. F. Mulla, c Milne, b Simms	... 1		
S. F. Madon, c Cooper, b Simms	... 3		
M. D. Bulsara, not out	3		
Extras	...22	Extras	... 0
Total	170	Total (for 2 wkts)	22

Quadrangular Cricket in Bombay.

At a meeting of representatives of the four leading Gymkhanas of Bombay viz. the Bombay, Parsi, Hindu and Mahomedan Gymkhanas held in the Bombay Gymkhana pavilion, it was decided to hold a quadrangular cricket contest from next year, the Islam Gymkhana representatives having undertaken to get up an All-India Mahomedan team to participate in the contest.

There will be altogether three matches and lots will be drawn to decide what team shall play each other in the two preliminary contests. The final will be played between the winners of the first two matches, and in the event of its not coming to any definite conclusion, the results of the first innings will be considered decisive and in case the first innings are not completed a spin of the coin will decide who shall play the final match. All matches will be played on the Bombay Gymkhana ground, the contest commencing most probably in the third week of September and ending on Wednesday of last week of the same month.

OTHER GAMES.

CALCUTTA—Poojah Golf.

The Calcutta Golf Club offered a prize valued at Rs. 50 for competition among its members over their Links at Tollygunge during the Poojah recess. The conditions were 18 holes, handicap, medal play, the competitors were allowed to return as many scores as they wished. Almost all the members who were in Calcutta during the holidays competed for the prize. The competition was eventually won by Mr. A. S. Paterson of Messrs. Blackwood, Blackwood and Co. It may be recalled that Mr. Paterson had won the same competition last year.

MYSORE—Dasara Polo Tournament.

In the first match A team, Local Service Lancers, beat A team, Imperial Service, by 9 goals to nil. The second match resulted in an easy win for the Mysore Gymkhana against B team, Local Service Lancers. The Maharajah and Yuvaraja played in the winning team. In the third match A team, Local Service Lancers, beat B team, Imperial Service by 6 goals to 3.

The polo final match was between the Mysore Gymkhana and "A" team, Imperial Service Lancers. For the Lancers Faiz Mahomed and Bharmji Sawant played a brilliant game and won by six goals to two.

INDIAN GAME BILL.

The Indian Game Bill which was sent home for the approval of the Secretary of State will be introduced into the Legislative Council during the next cold weather.

CUTTINGS

FROM

LEADING JOURNALS.

The King's Coronation Fete to 100,000 children at the Crystal Palace.

"To transport 100,000 children without an accident and without any appreciable loss of time, to parade them before their Majesties in such a way that all had a glimpse of their Royal host, and to feed them with tons of cakes and buns and lemonade till every little appetite was satisfied was a real triumph of generalship, of which even a trained military organiser might be proud."—*The Daily News*.

"There were no accidents, save a solitary sprained ankle. There were no mishaps even. There was no bustling and no crowding. It might have been a long and carefully drilled stage army, so orderly, so precise, were these vast divisions of tumultuously happy children. All those who bore any part in the arduous work of preparation will be amply repaid when they read the King's generous appreciation of their 'Judgment, ability, and kindness of heart.' As for the children themselves—they were a sight to put the pessimist to shame. Those who encountered the converging battalions at any point found them irresistible—so high their spirits, so bright their faces, so infectious the delight which danced from their eyes. And

their behaviour and self-restraint at the Palace were splendid. The King's little friends remembered whose guests they were, and they were a credit to their teachers and to their schools."—*Daily Telegraph*.

"The railway arrangements were perfect, and the transportation was effected without a hitch. At the Palace, too, all went like clock-work. The children were piloted, fed, and cared for under a carefully-devised scheme, admirable in all its parts, a real triumph of organisation. Over six thousand teachers and nurses gave themselves up whole-heartedly to the children, and the fullest credit is due to all who took part in the arrangement and carrying out of the scheme."—*Morning Post*.

Bar Preliminary Examination.

The abolition of the old *Bar Preliminary Examination* seems to have caused a considerable flutter among *embryo* Barristers. Previous to the present year, the entrance test was an easy matter, consisting, as it did, of translation from Cæsar, English, and English History. But now everything is changed; candidates must take up either the London Matriculation, or one or other of a considerably long list of substituted examinations, before they can join an Inn. In our opinion, the best and, in the end, the simplest plan, is to select the London Matriculation, as it is a good "stand-by" for any position and gives easy access to a Law Degree in the London University. As, however, many people fight shy of this ordeal—and without doubt it is a fairly severe one—we recommend as next best among the variety offered, the Oxford and Cambridge Senior Local Examinations. With a careful selection of subjects, adapted to the particular bent of the individual concerned, there ought not to be any great difficulty in combating this test and securing

the necessary certificate.—*State Correspondent* (Sept.'11)

The Working Men's College.

Fifty-seven years ago Frederick Denison Maurice founded the Working Men's College, now situate in Crowndale Road, St Pancras. He meant to help students to lay the foundations of a wider culture, quite without consideration of benefit to their pecuniary position. They were to obtain without fee an education which would make them better citizens with enlarged outlook. They were to be taught by university men who should give their services. Closer acquaintance on the part of the two classes of men, one with another, and mutual esteem were sure to follow the intercourse of the college. So thought the founder and his co-workers who started the college. To many of their contemporaries they appeared visionaries, and the idea was looked upon as that of an enthusiast rather than of a man of the world. But the visionaries have proved clear-eyed seers.

Indeed, the vision after many days has assumed a very tangible form. The beautiful buildings of to-day are the home of a great work of culture. There are 1,400 students, many of whom have been members of the college for from ten to fifty years. The curriculum ranges from the teaching of spelling and simple arithmetic to philosophy, political science, and higher mathematics while the fees—there are fees now—are low enough to attract the quite poor workman or clerk. The college is the centre of many clubs and societies, and a generally vigorous social life. Nor is the staff less attached than the students: seventy teachers, mostly university men, are working without pecuniary reward; many of them have proved their enthusiasm by their length of service: one has taught for twenty-five years, another for forty years. Ruskin, Ford Madox Brown, "Tom" Hughes, Dr. Furnival, Dante Gabriel Rossetti, and Burne Jones are among

the famous names on the teachers' roll. Professor Dicey, Fellow of All Souls', is the present Principal—*School Guardian*.

The Value of Examinations.

In reflecting upon the opinions expressed at the British Association meeting in regard to the place of examinations in education the conclusion is forced upon the mind that in the general attitude towards this matter there is confusion between what is education and what is selection (says *The Times*). It cannot be denied that in certain universities the examination scheme is directed primarily towards the acquisition of funds. In such cases examinations are only remotely an affair of education; they have some selective value, but they produce shoals of youths without direction or purpose—human scalars when the world wants human vectors. If university finance be set aside the question narrows itself down to deciding, first, whether it is desirable to establish any standards at all of school and college work. If the principle of establishing standards is accepted, it then remains to decide whether, in addition to their use in the educational system, those same standards constitute the best means of estimating the relative fitness of candidates who have reached the age of discretion to enter a profession like that of engineering, and to take up appointment in the order of the degrees of success. The educational value of examinations must, in fact, always be regarded apart from the selective value. As a selective agency the examination system has been a restraint upon jobbery, incompetence, and nepotism. Experience shows that it provides a useful average, if not in every instance quite the best type of men, for the professional work of the world; and its operations are clean and wholesome. On the other hand, those who advocate the subversion of the examination system may with perfect fairness assert that as the standards are arbitrary it is consistent that the tests

should be arbitrary, and that consequently selection should be left to the judgment of an arbitrator. The truth is, however, that an arbitrary standard may be a standard of a very high order of precision, but an arbitrary method of making comparisons against such a standard easily leads to false issues.

Mohammedan University.

The aspirations of the late Sir Syed Ahmad Khan are now, after a generation, in a fair way to being crowned with fulfilment by the elevation of Aligarh College to the dignity of a Mohammedan University. The Marquis of Crewe has definitely sanctioned the proposal, with conditions of endowment, which will no doubt be fully satisfied through the exertions of the Aga Khan. It is very satisfactory that the Mohammedans should be waking up to the importance of education, for their backwardness has hitherto handicapped them seriously in practical life. But the British Indian Government has always religiously ignored sectarian differences; yet here and now it grants a charter to a distinctly denominational institution. Still there seems to be no reasonable objection to the charter: it is indeed an "official recognition," but it is purely educational, and implies no preference whatever for the Mohammedan religion. The educational aspirations at Aligarh have stirred similar aspirations at Benares, and there have already been mooted proposals for the establishment of a Hindu University in the holy city. On compliance with the same terms, no doubt the Hindus will also receive a charter. We see no reason to believe that the Aligarh charter "marks a beginning of a change in the general trend of British educational policy in India" or that it is "the first step towards a scheme of concurrent religious endowments in India." So far as yet appears, the Government requires the promoters to find the money—*Educational Times*.

THE COLLEGIAN.

AN ALL-INDIA JOURNAL OF UNIVERSITY & TECHNICAL EDUCATION.

PUBLISHED BY THE 15th & 30th OF EVERY MONTH.

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NOTICE TO CORRESPONDENTS.

Correspondents are requested to write legibly on one side of the paper while sending in MSS. for the Press.

Communications intended for publication must be accompanied by the name and address of the writer, not necessarily for publication but only to satisfy the Editor.



By the courtesy of Sir Darabji J. Tata.

The Biggest Donor in the cause of Education in India.

Born, March 3rd, 1839.

THE LATE MR. J. N. TATA.

Died, May 19th, 1901

Among his many sided activities and cosmopolitan philanthropy, may be mentioned his donation of above 30 lakhs of rupees in connection with the Indian Institute of Science, Bangalore. The conception of a scheme for such an institution devoted to post-graduate study and research in science, which should ultimately develop into a University of modern type is due to Mr. J. N. Tata. During the latter years of his life Mr. Tata devoted most of his time and attention to the subject. His scheme was about to be carried out at the time of his death. Effect has since been given to his wishes by his sons Sir D. J. Tata and Mr. R. J. Tata.



THE COLLEGIAN

An All-India Journal of Education

CALCUTTA, WEDNESDAY NOVEMBER 15, 1911.

The Royal Visit.
Durbar Programme.
The Children's Fete at
Bombay.

It was on the 11th of November 1911 that our gracious Majesties sailed for India. "This is the first visit", Mr. Asquith said in a speech the other day, "which a British sovereign has ever paid to his Indian Dominions, and I need not say in your name and in that of the Empire that they carry with them the hopes and prayers of all their subjects."

Their Imperial Majesties the King and Queen are expected to arrive in Bombay on the 2nd December. Their Majesties will land at the Apollo Bunder at 9.30 A. M. and will drive to the Old Bombay Exhibition enclosure where their Majesties will be conducted to a special dais built in front of the Bombay Gymkhana buildings. Children, who are expected to number about 26000, will be arranged in a semicircle in the stadium facing the pavilion. The open space of this semicircle will be arranged for selected bands of children belonging to European, Gujarati, Marathi and Urdu Schools, who will sing in succession one or two verses each of the National Anthem in the respective languages of their schools. There will be an Exhibition of daylight fireworks. The children will then be presented with souvenir cups, sweets.

The following is the Coronation Durbar Programme :—

Thursday, 7th December—The State entry to Delhi at 10 a. m.; reception of Chiefs from 3 to 5 o'clock.

Friday, 8th December—Reception of Chiefs from 11.30 to 1.30; King Edward memorial ceremony at 3.40. Their Imperial Majesties have a dinner party at 8.

Saturday, 9th December—Reception of Chiefs from 11.30

to 1.30; semi-finals of the Polo Tournament and the final of the football, both at 3.30.

Sunday, 10th December Church service in Military Camps at 10.30.

Monday, 11th December Presentation of colours on the Polo ground at 11 a. m.; polo finals at 3.30.

Tuesday, 12th December The Durbar at 12 o'clock. State dinner and reception at 8 p. m.

Wednesday, 13th December—Reception of Volunteer Officers and Indian officers in the King-Emperor's Camp at 10.45 a. m.; State garden party and People's fete at 3.30. Their Imperial Majesties have a dinner party at 8 p. m.

Thursday, 14th December The Review at 10.30 a. m.; finals of the hockey at 3.30 p. m.; the Investiture at 9.30 p. m.

Friday, 15th December Review of police force on polo ground at 11 a. m.; Military tournament and point-to-point races at 3 p. m. in the afternoon. Finals of the boxing tournament at 9 p. m.

Saturday, 16th December State departure at 1 o'clock.

The bronze bust of the late Mr. Jamsheджи Nasserwanji Tata, Bombay's merchant prince, has been erected. It will be formally opened in the near future. On a semicircular plinth rises a pedestal on which stands a winged figure of "Fame" holding in her left hand a laurel wreath and in her right an olive branch. Beneath this figure is placed a handsome bust of Mr. J. N. Tata. It occupies one of the most important centres of the city opposite the Municipal offices and facing the Victoria Terminus. The bronze figures including the bust were designed and modelled by Mr. W. Robert Cotton, A. R. A. of London at a cost of £3000.

Tata Memorial
at Bombay.

It is gratifying to note the rapid progress of Education in the Punjab. New colleges are set up with commodious buildings, and we have noticed that in the course of the present year several new buildings are erected, three being built at Lahore alone. The expanded Islamia College, the New Dyal Sing College, the New building of the D. A. V. College (under construction) are all evidences of the educational

Progress of High
Education in the
Punjab.

activities at Lahore. In the province also we see many new colleges are set up as also funds are being raised for projected colleges. The projected Islamia College at Peshawar has already got about five lakhs of rupees all of which has practically been raised in the Frontier Province and the adjacent tribal tract.

The executive committee of the Indian Guild of Science and Technology have just issued a comprehensive handbook of Information for Indian students regarding facilities for education in scientific and technical subjects in the United Kingdom. It is certainly a promising production.

The Guild is the outcome of a new and very remarkable emigration which has carried away a large body of young Indians to study science and applied science with the special purpose of using it for industrial pursuits in their own country. One of the most serious problems which the Guild had to deal with was that relating to the possibility of securing facilities for its members to gain practical experience in the different branches of industry. In the majority of cases, notwithstanding the assistance of the advisory committee there seems to be great difficulty in securing admission into factories owing to the existence of the feeling that the trade is too full and the manufacturers in many cases seem to have more or less united in their refusal to take up apprentices unless they happen to be relations or sons of directors or friends. We are glad to note however that the Advisory committee are willing to consider individual cases on the merits of the applicant and the President of the Guild has been empowered to communicate with the authorities at the India Office, whose influence in this matter would certainly be of great assistance.

The Behar Conference.

In the Behar Conference Mr. Haque the President spoke at length on the question of higher education in Behar. The Patna College, the only Government College in Behar was far from being in a satisfactory condition. What they wanted was that the Patna College should be made into a first class residential College with chairs for all important branches of knowledge. He deplored the unsatisfactory representation of Behar in the Senate of the Calcutta University. A resolution proposed by Mr. Syed Hasan Imam supporting Mr. Gokhale's Education Bill was passed.

Bengal Literary Conference.

The Bengal Literary Conference meets at Chinsura this year and the local organisers are trying to secure Srimati Swarna Kumari Debi (wife of Mr. J. Ghosal) to preside on the occasion. Srimati Swarna Kumari edits the Bengali Journal "Bharati" and is the authoress of several Bengali books.

MADAME CURIE, has got the Nobel Prize for Chemistry this year. She is the greatest woman-scientist of the world and one of the greatest scientists of either sex. She has made remarkable research work in radium in company with her late famous husband. She is now a professor in the Ecole Normale Supérieure of Paris, and is 44 years of age.

At the last B. A. Degree examination of the Madras University, one Miss. Kansalia had the rare distinction of being the first Malayali lady-graduate of the University. The success of this young lady is all the more creditable when it is

First Malayali Lady Graduate.

remembered that female education is very backward in Malabar with its peculiar social customs and that Miss. Kansalia had not the benefit of a training in a College meant exclusively for girls. The public of Cannanore presented the lady with a gold medal with a suitable inscription in appreciation of her perseverance and the other good qualities which enabled her to pass through the difficult ordeal.

An orphanage at Bhavnagar.

Sanction has been given by the Maharaja of Bhavnagar to build an orphanage at Bhavnagar at an estimated cost of Rs. 47,000.

Educational Meeting at Madras.

A largely attended meeting of those interested in the progress of Indian education was held on November at the Hindu High School, Triplicane. The object of the meeting was to adopt a memorial to the Government with a view to making the study of Indian languages and literature more general among under-graduates than at present, and secondly to giving more full and ungrudging encouragement to the higher study of Indian languages and literature in the Presidency College.

Dewan Bahadur M. Audinarayaniah occupied the chair and explained the object of the meeting. Mr. T. Rangachariar made a lengthy speech and said he had no doubt that H. E. the

Governor would give his best consideration to their representations. He moved the adoption of a memorial which was read. The memorial was adopted.

The absence of a public Library in such a big place as Calicut, where there are so many enlightened men is really to be regretted. Our contemporary "*The West Coast Observer*" suggests: "To show our fidelity to His Majesty, to memorialise the Durbar, we require something that can be made use of by the public for ever, in sweet memory of our beloved Emperor. This cannot be done better than by the gift of a public library and reading room." A happy suggestion.

Patronage of Literature Fund Punjab.

In February, 1912, the Punjab Text Book Committee will recommend authors and translators residing in the Punjab who have published useful books in vernaculars—Urdu, Hindi and Punjabi—for grants from patronage of Literature fund. Authors and translators desirous of having their works considered in this connection should submit three copies of each of their books to the Secretary Punjab Text Book Committee before Jan. 1912. It should be noted that the books must have been published during the current year.



CALCUTTA UNIVERSITY.

ENGLISH.—The following works are recommended to indicate the standard up to which students will be expected to have read :—*Prose* :

Matriculation
Text-Books, 1913.

—Folk Tales of Bengal, Stories from the Odyssey, Readings from the Waverley Novels, Vol. I, Kingsley's Heroes, Robinson Crusoe, Legends of Greece and Rome, Arabian Nights, edited by Andrew Lang, Animal Story Book, edited by Andrew Lang, Rip Van Winkle, Legend of the Sleepy Hollow, Grimm's Popular Stories, Lamb's Tables from Shakespeare.

Poetry :—Macaulay's Lays of Ancient Rome, Jennings' English Poems, Part I, Children's Treasury, Part I, Lahiri's Select Poems.

BENGALI.—Sitar Banabas, Pratibha (Rajani Gupta), Savitri, (Chandranath Basu), Katha Sar (omitting the poetical portions), Sati (Dines Sen), Aryya Siksha (Pande).

HINDI.—Balbharat (Indian Press, Allahabad), Upadesa Kusumakar (excluding poetry pieces), Khadga Vilas Press, Bankipore.

URIYA.—Mrityunjay Kavyatirtha..Prabandhpatha, Madhusudan Rao...Prabandhamala.

URDU.—1. Urdu-i-Mualla. 2. Ibn-ul-Waqt. 3. Al Mamun. 4. Mitadu 'E-rasul, by a daughter of Maulvi Obeidullah. 5. Ek Khatun ki Musibatain, by Akhtar.

MATHEMATICS.—No text-books are prescribed or recommended. The subject is to be studied

in accordance with the Syllabus prescribed in the Regulations of the University.

SANSKRIT.—The following portions of the Calcutta University Sanskrit Selections for 1911 :—*Part I.* Panchatantram and Hito-padēsa Pages 1- 3, 29—84, Vishnupuranam Pages 97—108. *Part II.*—Sitaharanam Pages 117—135, Dhritarashtra-bilapa Pages 199—209.

PERSIAN.—University Selection complied and edited by Dr. E. D. Ross, PH. D., for the Matriculation Examination. *Portions to be read to be notified hereafter.* PERSIAN GRAMMAR.—The following books are recommended :—Dastur-i-Parsi-Amoz, Part I, or Miftah-ul-Quwaid.

ARABIC.—University Selections complied and edited by Dr. E. D. Ross, PH. D. ARABIC GRAMMAR. —A book on Arabic Grammar to be published by the University for the Matriculation and Intermediate Examinations.

BENGALI.—(*For female candidates.*) Iswar-chandra Vidyasagar's Sakuntala (Expurgated edition). Charupatha, Part II. Hemchandra Banerjee Poetical Selections (omitting the Introduction). DO. GRAMMAR. —Any of the following :—Nakuleswar Vidyabhushan—Bengali Grammar (new edition). Prasannachandra Vidyaratna Sahitya Prabes. Hrishikesh Sastri Bengali Grammar. Matilal Chakravarti Sahitya-bodh Vyakaran.

HISTORY.—*History of India.* The following books on Indian History are recommended to indicate the standard of knowledge required :—Adharchandra Mookerjee A...Short History of the Indian People, revised edition 1910. Haraprasad Sastri...History of India (revised edition, 1907 or later). Sir William Hunter...Brief History of the Indian Peoples. R. C. Dutt...A Brief History of Ancient and Modern India. A. F. Rudolf Hoernle and H. A. Stark...History of India, (Hindu Period only). C. R. Wilson...History of India, revised edition (British Period only). Karim and Ghosh...Students' History of

India (revised edition, 1910, Hindu Period only). Vincent A. Smith...The Students' History of India. *Administration and Progress of India under British Rule*.—N. N. Ghose...England's Work in India.

GEOGRAPHY.—The following books are recommended as indicating the methods of study and the standard of knowledge required:—A. J. Herbertson...The Oxford Geographies, Vol. II, J. B. Reynolds...Asia, G. Patterson...Geography of India, Part I (published by the Christian Literature Society, 1909), Blanford...The Rudiments of Physical Geography for the use of Indian Schools. The world with fuller treatment of India (Longman's Geographical Series for India, Book II). Blanford...Elementary Geography of India, Burma and Ceylon. J. F. Unstead...The Practical Geography, Parts I and II. The following book is recommended for the use of teachers in connection with the teaching of "Sand Modelling" in the lower classes of Schools:—A. E. Frye...The Child and Nature.

ELEMENTARY MECHANICS.—No text-books are prescribed or recommended.

On the results of the ensuing Matriculation Examination, 1912, the twelve-
Scholarships. third, grade junior Scholarship, attached to the Dacca Division will be distributed as follows:—Dacca, 4; Mymensing, 3; Faridpur, 2; Backerganj, 3.

MADRAS UNIVERSITY.

The new fellows named below are assigned to the faculties as under:—(1)
Fellows. Revd. C. I. Ghezzi, Faculty of Arts. (2) Surgeon General W. B. Bannerman and Lt. Col. G. G. Giffard, Faculty of Medicine.

At its meeting of 27th October 1911, the Senate accepted from the sub-
The Pope Medal. scribers to the Pope Memorial Fund an endowment of Rs. 1,500 invested in 3½ per cent. Government securities for the purpose of founding a gold medal in memory of the late Dr. G. U. Pope. The medal shall be awarded annually to the candidate who obtains the highest marks in Tamil composition, in the B. A. Examination.

Holders of completed Secondary School-leaving Certificates may be admitted by the Head of an affiliated College if he be satisfied as to their fitness to a University Course of Study and when so admitted shall be registered as matriculates of the University.

A convocation for the purpose of conferring degrees will be held in the
Notice of Convocation. Senate House, on Thursday, November 23, 1911, at 4-30 P. M.

For Morris and Skeat Specimens Part I
 V, VI, IX, XIII; Part II,—
Alterations in B. A. (Hon.) Text-books, 1911. I, VII, IX, XIII, XVI; *substitute*
 Middle English Reader, Emerson, Part I A i, ii, B xi. Part II—A i, vi, B ii, iii, iv, vi, vii, viii; C i, ii, iii.

The following awards of scholarships have been made by the syndicate—
Scholarships &c..

1. Johnston of Carnsalloch Scholarship—N. Saundararaj Peter, (A. M. College, Madura). 2. Sir T. Madhava Rau, First Prize—K. S. Rau (Presidency College); Do. 2nd Prize—V. Venkataraman (Presidency College). 3. Sir T. Muttuswamy Aiyar Scholar—M. N. Krishnan (Law College). 4. Anne Isabella Subrahmanyam Scholar—Miss Hilda M. Lazaras (Medical College). 5. Marsh Scholar—K. Saundaraja Rau (Presidency College). 6.

V. Rama Aiyangar M. A. Scholarship—T. W. Krishnaswamy Aiyar (Pachaiyappa's College).
7. Governor's Scholarship—C. K. Ananda Rau (Presidency College).

BOMBAY UNIVERSITY.

Sir Narayan Ganesh Chandravarkar is re-appointed as Vice-Chancellor of the University with effect from the 27th instant.

His Excellency the Chancellor is pleased to renominate Khan Bahadur Syed Shamsuddin Kadri B. A., to be an ordinary fellow of the University with effect from the date of expiry of his present term of office viz., 20th November, 1911.

The B. A., B. Sc., First LL. B, Final M. B. (Part I), L. C. E. and B. E. Examinations will commence on Monday the 20th November. The Examinations for the Degrees of M. A., second LL. B., LL. M., Final M. B. (Part II), M. D., B. Hy., and L. M. & S. begin on Monday the 27th November.

The Matriculation Examination commenced on Monday the 13th instant at the following centres: (1) Bombay, (2) Poona, (3) Ahmedabad, (4) Belgaum, (5) Karachi.

The Intermediate, Previous, F. E., S. E. (civil) Examinations were held on Monday the 6th instant and the following days.

Matriculation. *Compulsory English*—Messrs. Mirza Ali Akbar Khan, J. P. de Quadros, B. J. Wadia, P. Wren, A. Darby and Miss Hoffgaard. *Sanskrit*—Messrs. K. P. Trivedi and V. S. Ghate. *Latin*—Rev. R. Strachan. *French*—Messrs. P. L. Charlier and V. Hommel. *Persian*—Messrs.

Reza Khan and Minocher Homji. *Marathi*—Mr. Devdhar. *Gujarathi*—Mr. M. K. Mehta. *Sindhi*—Mr. T. L. Vasvani. *Optional English*—Messrs. D. H. Vachha and S. S. Paruck. *Mathematics*—Messrs. B. J. Naik, N. B. Pendse, J. C. Swaminarayan and B. D. Audich. *History and Geography*—Messrs. Clarke and Commissariat. *Elementary Science*—Messrs. B. E. Ghasvala and H. K. Mehta.

Previous and Intermediate. *English* (Previous)—Messrs. Rajavade, Strachan and Scott. *Do. (Int.)*—Revs. Devine and McKenzie. *Sanskrit*—Messrs. Pause and Kane. *Latin*—Messrs. Ailinger and Takakhav. *French*—Messrs. J. E. Davar and Peltier. *Persian*—Messrs. A. S. Shah and M. A. Haqq. *Mathematics*—(Prev.)—Messrs. Apte, Kapadia and Father Degen. *Do. (Int.)*—Messrs. Paranjpye and Steichen. *History*—Mr. Farrell and Rev. Vachh. *Physics*—Rev. F. X. Haan and Mr. Kantikar. *Logic*—Messrs. Bhate and Sukhtankar. *Chemistry*—Messrs. Fox and Normand. *Biology*—Messrs. Masani, Kanga, Hate and Fr. Assmuth.

B. A. and B. Sc. *English*—Rev. Robertson and Mr. Rawlinson. *Sanskrit*—Messrs. H. M. Bhadkamkar and B. R. Arte. *Persian*—Messrs. Ahmed and Sarfraz. *History and Pol. Econ.*—Messrs. Wadia, Muller, Hodivala and Rev. Mac Omish. *Logic and Moral Phil.*—Messrs. Bhate and Sukhtankar. *Mathematics*—Mr. Paranjpye and Rev. Steichen. *Chemistry*—Messrs. Fox and Normand. *Physics*—Fr. Haan and Mr. Kantikar. *Botany*—Messrs. Kanga and Hate. *Zoology*—Messrs. Masani and Assmuth. *Geology*—Messrs. Kanga and Page. *Physiology*—Major Hutchinson and Mr. Navati.

First LL. B.—Messrs. Gharpur, Tarachand and Patkar.

M. A. *English*—Rev. MacOmish and Mr. Turnbull. *Sanskrit*—Messrs. Dhruwa and S. R. Bhandarkar. *Persian*—Messrs. Abbas and Surbakani. *History*—Mr. Thakum and Rev. Flink. *Philosophy*—Rev. Robertson and MacKenzie.

Mathematics—Principals Paranjpye and Sanjana. *Physics*—Revs. Mackichan and Steichen. *Chemistry*—Mr. Harold H. Mann and Revd. H. Sierp. *Natural Science*—Mr. Masani and Rev. Assmuth.

Second LL. B.—Messrs Kijji, Bhatavadekar and Rangnekar.

LL. M. (Br. II, Hindu Law)—Messrs. Mulla and Jayakar. (Br. IV)—Messrs Cama and Mulla.

PUNJAB UNIVERSITY.

The Chancellor is pleased to nominate the following gentlemen to be fellows of the University. (1) Hon'ble Mr. Justice Robertson, (2) Raja Sir Hirnam Sing, (3) Revd. E. L. Porter.

LL. B., 1911-93 passed, of whom 28 are placed in First Division and 65 in Second; Law College—1 Div. —21, II—36; Private students—1--7, II--29.

First Exam. in Law, 1911-120 passed, of whom 112 from the Law College and 8 private students.

Special Test in Law—Sudhir kumar Mukerji; Muhammed Afzal Makhdoom, B. A., LL.B.

B. A. & B. Sc. Honours—Two honour papers (100 marks each) will be set in addition to the pass papers in each subject. In Physics, Chemistry and Geology the total of 200 marks may be distributed between two Hon. papers and an Honour Practical Examination, in Mineralogy, one Hon. paper and an Hon. practical exam. Unless a candidate obtains 50 per cent in the Pass papers in the subject in which he seeks for Honours his Hon. papers shall not be examined. To obtain Honours a candidate must obtain at least 33 p. c. in the Honours papers taken together. The order of merit in a subject will be settled by the combined results of the Pass and Hon. Papers in that subject. Marks gained in Hon. papers shall not be added to the total obtained in pass papers.

ALLAHABAD UNIVERSITY.

Candidates for the M. A. Final who have studied at a College for two years and failed, should be permitted to appear at future examinations for the degree of M. A. without being required to attend further lectures, provided that the Principal of their College recommends their application. The same principle should be applied to persons who have been allowed to appear as Private Candidates for the M. A. Final as Teachers. *This, however, does not exempt such would-be private candidates from applying, as usual, for the grace of the Senate, under section 19 of the Indian Universities Act, 1904.*

At the annual meeting of the Senate of Allahabad University the honorary degree of Doctor of Laws was conferred on Sir George Knox and on the Hon. Pandit Sunder Lal, and the honorary degree of Doctor of Letters on Mr. Venis, Principal, Queen's College, Benares.

Comparative table showing the number of candidates that went up for, and the number passed in, the University Examinations of 1910 and 1911:—

Name of Examination.	1910.					1911.				
	Went up for.	Passed.	Per cent.	of those who went up for.	of those who passed.	Went up for.	Passed.	Per cent.	of those who went up for.	of those who passed.
M.A. (Final)	24	16	69	32	23	71.8				
M.A. (Previous)	72	42	60	74	39	57.3				
M.Sc. (Final)	5	5	100	4	4	100				
M.Sc. (Previous)	5	4	80	14	12	85.7				
B.A.	664	243	37	779	371	49.1				
B.Sc.	163	58	37	170	98	60.1				
Intermediate	1,582	680	43	1,425	707	50.6				
Matriculation	3,562	981	28	3,458	1,451	43.1				
LL.B. (Previous)	261	146	62	320	140	47.6				
LL.B.	163	90	58.8	204	98	49.2				
L. T.	27	22	85	31	27	88.1				



AND SCHOOLS.

The College re-opened after Long Vacation on the 6th instant. Mr. Heaton, the Principal who was expected back from England did not join, consequently Mr. W. Tate the senior Professor (who was also on furlough) took the office of the Principal. Mr. Bruhl, last year's officiating Principal reverted to his post as Professor, he will take some of the Chemistry Classes. We heartily welcome Dr. Peters the new Professor of Mathematics for the post was vacant throughout the last year. Mr. Richardson the Professor of Engineering also joined the College after a year's furlough as also Mr. Everett. Unlike previous years the second year Engineers had to start on their Survey Tour this week along with the third year Engineers.

Mr. F. S. Davies, B.A. late Principal of the Ernakulam College, and lately appointed as Director of Education, Cochin State, was recently given a farewell address in the College Hall on the eve of his departure for Trichur. The College Hall was tastefully decorated for the occasion and there was a large gathering including a number of Princes of the Cochin Royal Family, the local officials, Vakils, Teachers and others. The chair was occupied on the occasion by one of the Princes and proceedings began with an introductory speech by the Chair-

man. This was followed by the reading of the address by one of the Princes, a student of Mr. Davies. The address speaks for itself and shows the esteem in which Mr. Davies is held by the College. After it was read it was presented enclosed in a beautiful casket. Mr. Davies then made a suitable reply. The next item was the concluding speech by the Chairman, after which the Chairman and Mr. and Mrs. Davies were garlanded. The evening's function terminated with the distribution of flowers and the sprinkling of rose-water, and cheers for His Majesty the King-Emperor and H. H. the Raja. In the night from 8-30 to 11-30 there was a variety entertainment in the College Hall in honour of Mr. Davies.

The report read at the annual Prize Day showed that the number of pupils on the last day of the previous year was 466 against 562 in the preceding year, though the average strength showed an increase of 11.1 over that of the preceding year. About 82 per cent. of the strength was contributed by Brahmins. In spite of the liberal encouragement afforded them by the State in the shape of remission of fees, partial or entire, the Muhammadan and Panchama classes of His Highness' subjects have been rather slow to avail themselves of the boon of Higher education which is given here comparatively cheap.

The expenditure incurred on account of the College was Rs. 21,760. The receipts from fees amounted to a little over Rs. 11,820, and covered over 54 per cent. of the outlay. The two outstanding features of the academic year under report were: (i) the introduction of the School Leaving Certificate scheme of the British Government and (ii) the visit of the University Inspection Commission.

Mr. Radhakrishnaiyar, the Principal has taken leave. The senior lecturer Mr. Rama

The Civil
Engineering
College, Sihar.

Puddukota
College.

Ernakulam
College.

Chandra Sastri, is acting in his place and Mr. Tyagarajaiyar has been appointed to act as senior lecturer.

Deaf and Dumb
School, Mysore
Decennial
Anniversary.

The decennial anniversary of the School which is being maintained partly from public subscriptions and partly from Government and Municipal funds, was celebrated last week with Mr. Visvesvaraya, Chief Engineer, in the chair. The school is well-conducted and serves, as the President said, one of the higher purposes of civilization. The inception of this school is due to Mr. Srinivasa Rau, who was heartily thanked by the President.

The school has been the recipient of many medals and certificates from various Exhibitions in and outside Mysore. The financial position as shown in the report, is not very strong, the expenditure being higher than the income. We trust the leading men of Mysore will show their patriotism by creating a permanent fund for the working of this school.

Girl's High
School, Calicut.

It is rumoured that the Mission Girl's High School building is going to be shifted from its present site to the back side of the church building where the erection of new building is under contemplation. The present building is reserved for the exclusive use of the Primary Department. The proposed erection of a new building would involve the putting down of many Colleges which are now occupied by Christians. From a Sanitary standpoint, the High School building, as it stands at present is and will be far better off than it should be when within the limits of the Mission Compound.

Bombay Veteri-
nary College.

Candidates intending to join this College during the coming year should submit their applications immediately. An Entrance Examination for those,

who have not passed either the School Final or Matriculation Examination, will be held on the 4th January 1912.

Dyal Singh
College Lahore.

The College anniversary was celebrated with great eclat. Meetings were held in the morning when lectures by professors and students were delivered, and the evening was especially occupied by a Social gathering in which were invited professors of the Colleges as well. The next evening the College Students performed the drama of 'A Midsummer Nights Dream' with great success all due to the strained exertion of Mrs. Philip Richards, wife of Professor Richards of the College.

Mr. J. M. Dutta M. Sc. (Cal) who came only recently as Professor of Science has tendered his resignation owing to some strained circumstance between him and the Trustees. He has not as yet been relieved of his duties.

Govt. College
Lahore.

Professor L. P. Saunders (Professor of Philosophy Government College) has come back from leave and has begun his work in the College.

St. Peter's
College Agra.

Rector's Day was observed at St. Peter's College, Agra, on Wednesday, the 8th instant. On the previous evening an address was presented to the Very Rev. Father Norman, D. D., by the staff and students, in which grateful mention was made of the excellent work accomplished by Dr. Norman in the interests of the College during the last year. Special mention was made of the new Bakery that was recently opened in connection with the institution. In a few choice words the Rector acknowledged his thanks for the sentiments expressed, referred to the great assistance given throughout the year by the Rev. Father Smith, Vice-Rector, and other members of the Staff. The following morning High Mass was celebrat-

ed at the Cathedral, and in the evening a variety entertainment took place in the College Hall at which the boys of the College, as well as several friends assisted.

A very important function which marks the laying of a new movement at Aligarh was performed on the 7th November when Mrs. Porter, wife of the Lieutenant-Governor of the United Provinces, laid the foundation-stone of the first hostel of the Moslem Girls' Normal School in the presence of a very large and distinguished gathering of European and Indian ladies, many of whom came specially for the occasion from Hyderabad (Deccan), Karachi and other distant places. Very satisfactory *purdah* arrangements were made and no pains were spared to ensure the success of the proceedings, and the whole place presented a very lively appearance. At 3 p. m. Mrs. Porter accompanied by Mr. Abdullah Nawab Mozamullah and escorted by the college riding squad arrived at the outer entrance and was received by Mrs. Towle, Mrs. Horovitz and other European ladies. She was then conducted to a *shamiana* inside where the Musalman ladies were introduced to her. Mrs. Porter having taken her seat on the *dais*, Mrs. Mahomed read the address which showed the progress made in the school and the urgency of attaching hostels to it. In reply Mrs. Porter heartily congratulated the members and the secretary of the Mahomedan Female Education Association on the success of their efforts and dropped many hints of kind advice. With the assistance of the ladies present she then laid the foundation-stone and wished the movement every success, promising also to take interest in the hostel. Mrs. Abdullah then in an impressive speech thanked Mrs. Porter for the trouble she had taken. The rest of the time was spent by Mrs. Porter in conversing with the ladies and everyone left the place with the happiest recollection.

Aligarh Moslem
Girl's School.



From the Rao of Cutch Scholarship fund are instituted scholarships tenable at the Sir Jamsetji Jijibhai School of Art at Bombay.

The term of special scholarship of Rs. 50 a month awarded to Mr. P. N. Kelley is extended up to 15th July 1913 at the Thomason Civil Engineering College, Rurki.

Assam Engineering Scholarships.—Two scholarships of Rs. 25 p. m. each tenable for four years at the civil Engineering College Sibpur from 1st November 1911 are awarded to (1) U. Shondra Mohon Roy and (2) Golap Chandra Goswami.

Mr. Arthur Hurst is appointed to be Assistant Principal of the Serampore Weaving School from the 27th November 1911.

Colonel C. H. Bedford, M. D., I. M. S., lately Chemical Examiner and Bacteriologist, Burma, has munificently decided to bequeath from the date of the death of himself or his wife, whoever may be the survivor a sum of several thousand pounds sufficient to afford ample endowment for two or more scholarships and to provide the necessary working funds in connection therewith, for the prosecution of scientific and technical research in connection with the development of Indian industries.

The ceremony of opening the Agricultural College and Research Laboratories at Cawnpore will be performed by the Lieutenant-Governor on the 18th instant.

A munificent
bequeathal.

Cawnpore
Agriculture
College.

Agricultural Education in Bengal. The Bengal Government resolution, just issued on agriculture, shows no very appreciable progress made in imparting agricultural education. It was decided that agricultural classes in ordinary schools should be discontinued and a simple course of nature study should be prescribed in primary and middle schools. Referring to fisheries the resolution says that much useful information has been collected, but their results are inconclusive.

Govt. School of Commerce Calicut. The second Anniversary of the commercial Teacher's union attached to the Institution was celebrated in the local Jubilee Hall on the 6th instant, under the distinguished presidency of Mr. Imbichunni Nair subjudge, Calicut. Almost all the elite of the town graced the occasion with their presence. Mr. C. V. Venkataraman jyengar High Court Vakil delivered a very interesting and instructive lecture on 'struggle for Life,' which created great enthusiasm among the audience. The members staged a Tamil Dama 'Vasanthika' which was very creditable and splendidly performed.

OTHER EDUCATIONAL ADVANCES.

THE HINDU UNIVERSITY.

Messrs Dharmsey Morarji Gokuldas and Norotam Morarji Gokuldas have subscribed Rs. 1 lakh to the Hindu University. This brings the total to Rs. 35 lakhs.

The following is the text of the Memorandum drawn up and agreed at Dharbhanga ghat, Benares, on the 22nd October regarding the amalgamated scheme of the Hindu University:—

1. That the name of the University shall be the Hindu University. 2. That the first governing body shall consist of representatives of the Hindu community and Mrs. Annie Besant and a representative trustee of the Central Hindu College. 3. The theological faculty shall be entirely in the hands of Hindus. 3. That the petition for a charter now before the Secretary of State for India shall be withdrawn. (Sd.) Rameshwar Sing, Annie Besant, Madan Mohan Malaviya, Sunderlal, Gangaprasad Varma, Bhagwan Das, Ishwar Saran.

The Hindu University Scheme has been advanced a step further and the Hon'ble Mr. Butler, Member of the Viceroy's Executive Council in charge of the Education Department, has agreed to receive a representative deputation at Delhi on December 2. The movement is receiving substantial support from the princes and the people of India.

A Hindu University committee has been formed at Jubulpur with its premier citizen,

Dewan Bahadur Seth Ballabh Das, as President. Dewan Bahadur Ballabh Das is perhaps the wealthiest man in the Central Provinces and certainly one of the wealthiest in all India. It is therefore in the fitness of things that he should take the lead in promoting the movement in his city and province. And he should secure the active co-operation of members of the bar who form the most intelligent, independent and well-to-do section of the community. Jubbulpur ought to and we trust will give a good account of itself in connection with the Hindu University project.

Hon. Pandit Sundarlal, Rai Bahadur, C. I. E., has accepted the post of Secretary, Hindu University Society.

The Hindu University deputation visited Unao the 10th and 11th November and Sitapur on the 12th November.

Activity of C. H. C. Boarders:—

The first group of boarders who were to wait on pilgrims went out the morning of Nov. 3rd accompanied by the *Nagar Sankirtana* group, to the various ghats and temples, for collections for the University. Another party went out to a small village, Chetipur.

The pilgrims showed much enthusiasm in the way of giving money for the University. On the whole the undertaking was a success as it created a very good impression among the people and made them feel interested in the University movement.

The Governing body of the Gurukul, Kangra, has sanctioned the admission of 20 "brahma-charies" for next year.



Forthcoming
Imperial
Conference
Of Teachers'
Associations.

THE League of the Empire was founded in 1901. In April last it turned its attention very seriously in the direction of the teachers. At the April Education Conference of the League representatives of the Overseas Education Departments placed on record their high appreciation of its services, and carried a resolution that increased facilities are desirable for teachers to migrate more easily throughout the Empire for the purposes of study and conference. Next year the League is to hold in London its first conference of representatives of the teachers' associations in all parts of the Empire. Support is promised by educational associations overseas and at home. At home the Association of Directors and Secretaries for Education will be represented by Mr. D. T. Cowan, Director for Hampshire, the College of Preceptors by Rev. J. O. Bevan, the Association of Head-Masters by Canon Swallow, and the National Union of Teachers by Miss Cleghorn and Mr. Marshall Jackman. The Association of Assistant-Masters in Secondary Schools have appointed Mr. A. A. Somerville of Eton, that of assistant-mistresses Miss E. S. Lees. Mr. Clifford Smith and Mr. T. Gautrey will represent the London Teachers' Association. Professor Ernest Gardner is chairman. It is hoped in the course of the next few weeks to get the general lines of the conference well defined.

The President of Magdalen College, and the promoters of the Central China University scheme published a letter to-day, in which they appeal for £250,000. They hope to raise half of this sum in Great Britain and half in America.

They say that present events force them to take immediate action.

An advertisement of two columns in the *Times*, explains the objects and importance of the scheme and the moral and religious interests involved.

This winter half-year there is being opened at Leipzig a new Academy for Women (*Hochschule für Frauen*). Its aim is to fit women for social work; it is, in the German phrase, *eine höhere pädagogisch-soziale Bildungsstätte für die Frauenwelt*, a place where women will be able to get a training distinct from that offered by the university. In it they will be taught the work of maternal education and they will be equipped for service to the community in general. Two forms of instruction have been planned—"free lectures" (*freie Vorlesungen*) and "courses of study" (*Studienkurse*); to the former all educated women will be admitted, to the latter only those provided with a certificate of "ripeness" (*Reifezeugnis*) or specially approved. In the "free lectures" the subjects treated will be philosophy (introduction to philosophy, history of philosophy, psychology, ethics, aesthetics), pedagogy (psychology of children, history of the education of women, hygiene for home and school), and economics (woman's social work, the legal status of women, introduction to political economy). The "courses of study" include such subjects as the poor law, Fröbelian education, and methods of investigating the spiritual life of a child. Opportunities for practical exercises will be given.

Chinese
University.

An Academy for
Women.

Higher Education
in Orange River
Colony.

It is chiefly in Grey University College (which is making satisfactory progress) that higher education is provided for. An administrative change affects it. During the last session of the O. R. C. Parliament the control of the institution was placed on a proper footing by the "Orange River Colony Higher Education Act, 1910," which ordains the appointment of a Council of ten members. This Council has already entered upon its duties. According to the South Africa Act, 1909, Higher Education was separated from Secondary and Elementary Education, and as the former now falls under the Minister of Education and the Union Parliament, in future the management of the Grey University College will be outside the jurisdiction of the Education Department. Tweespruit Agricultural College will also, as it seems, be transferred to the direct control of the Minister of Education.

A "PIOUS FOUNDER" of a type little known in England has passed away in the person of Mr. H. O. Wills, of Bristol. It was his offer of £100,000 for a Bristol University provided that a charter was obtained within two years that brought that university into being. America has had its Carnegie, Rockefeller, Stanford, and others to give millions apiece to universities, Canada has its Lord Strathcona, Scotland has benefited greatly at Mr. Carnegie's hands, but in England—with the exception of the Rhodes bequest to Oxford—no one of recent years has done anything so magnificent to connect his name with a university as Mr. Wills did.

The late
Mr. H. O. Wills.

A Great
Scholarship
Competition

At Cambridge a combined examination for 68 entrance scholarships and a number of exhibitions at (1) Pembroke, (2) Gonville and Caius, (3) King's (4) Jesus, (5) Christ's, (6) St. John's, and (7) Emmanuel Colleges, will commence on Tuesday, December 5th. Mathematics, Classics, and Natural Sciences will be the subjects of examination at all the colleges, and in addition also History at all but (1) Modern Languages at (2), (3), (5), (6), (7), and Hebrew at (2) and (6). Every candidate will be required to satisfy the examiners that his knowledge of Classics and Mathematics is sufficient to enable him to pass the previous Examination by October 1912.

Pandit Girija Sankar Bajpye B. Sc. of the Muir Central College, Allahabad has been granted the Government State Scholarship for the year 1911. He is going to Oxford with a view to qualify himself for the Indian Civil Service. He is the son of Pandit Sitla Prasad Bajpye, Subjudge, Lucknow. He belongs to a high family of Kanunjia Brahmins in Oudh. He had a brilliant University Career.

What our
students are
doing abroad.

Mr. Biman Behary Dey who went to England last September, has joined the Royal College of Science, London and is doing research work in Organic Chemistry.

Mr. J. S. Nicholas, son of P. Nicholas Mudaliyar of the Jaffna Kachcheri, has passed the London Matriculation examination creditably.

A FEW STRAY THOUGHTS ON KALIDASA.

'It seems almost an irony of fate that the past should be considered a blank in a country where ancient seers have handed down traditions and elaborate compositions through thousands of years and where generation after generation has preserved the heritage by a feat of memory which is considered a miracle in modern times !' Yet to cull out the genuine history of the lives of the poets from amongst the *debris* of antiquity calls for the strength and power of a Hercules. Indeed, the favoured sons of the Muses, who immortalised others by their divine inspiration, seem to have been studiously negligent in leaving any record about themselves save and except their monumental works, and time has succeeded in keeping some traditions only, most of them, no doubt, of an apocryphal origin. Yet it cannot but be accepted on all hands that an attempt at a thorough study of a poem without knowing something about the life of the poet who composed it and the times in which he lived is as futile as the attempt of a blind man to paint a landscape. The opulence and luxury of ancient India is only a dream to us. The atmosphere the poets breathed, the luxury in the midst of which they wrote, the natural surroundings and social environments that actuated them in giving free vent to their genius, were quite different from the circumstances we are in ; and as such, no study of a scientific nature can be carried on without an acquaintance with them. Indeed the writings of a poet cannot but embody the crying sentiment of the time, the social vices and virtues &c, and what may appear to us an insoluble mystery must have been as patent in the days of the poet as the noonday sun. Under these circumstances, scanty though the materials at our command are, it is at least commendable to start an enquiry about the poet whose 'marvellous works stand as a column to mark the achievements of Aryan civilisation in India and will do so till another universal deluge sweep them away.'

'Kalidasa has been the darling of India for more

than nineteen hundred years.' The Aihole inscription of Pulakesi II (634 A. D) speaks highly of the poet along with Bharavi and others. (1) Banabhatta in the introduction to his Naishadhacharita alludes to Kalidasa with deep admiration. (2) Kumarila Bhatta, the bitterest foe of the Jainas and the Bauddhas, who flourished in the first half of the eighth century reverentially refers to Kalidasa in his Tantravartika. (3) The author of the Ganda-vaha, a Prakrita poem of the eighth century refers to the author of the Raghuvamsha in verse 800. Kashiraswamin, the well-known lexicographer quotes from the Raghuvamsha, Vikramorvasiya and Meghaduta. Again *Meghaduta* was incorporated, by way of *Samasva*, into the *Parsvabhhyudaya* by Jinasena in the beginning of the ninth century. In the first half of the tenth century (about A. D. 945) when *Krishnaraja* III was ruling over the Kanarese and Mahratta countries, his court-bard Pauna boasts that he is superior even to Kalidasa. Besides these, numerous editions of his works have been published, voluminous commentaries have been written, various translations in the different dialects of the country have been made. All these, no doubt, bear ample testimony to the affectionate zeal and loving care with which his works have been and are being studied. In short from the snow-capped summit of the Himalayas in the north to the southermost point of cape Comorin there is not a single educated man who has not read at least a canto of his poems or an act of his dramas. But his fame is not cribbed and cabined within the narrow limits of his native land alone, it has travelled to distant countries and foreign climes. It has like a divine magnet attracted scholars and distinguished men of Europe and America. Along the banks of the Rhine and of the Thames he is

(1) The text runs thus :—

येनाद्योजि न वेष्ट्य स्थिरस्यविधौ विवेकिना जिनवेष्ट्य ।

स विजयता रविकर्त्तिः कविताश्रितकालिदासभारविकीर्त्तिः ॥

Ind. Ant. Vol. VIII, P. 237.

(2) निगंतासु न वा कस्य का.कदासस्य स्तुतिषु ।

प्रीतिर्मधुरसार्द्रांस्तु मञ्जरीष्विव लायते ।

(3) एवं च विद्वत्पण्डित विनिर्गन्तं प्रसिद्धरूपं कविभिर्मिदृशितम् ।

सतां हि सन्देहपदैषु वस्तुषु प्रमाद्यमनःकरणं प्रवृत्तयः इति ॥ P. 133

at this day read with as much enthusiasm and delight as he is on the banks of the Ganges and the Godavari. Goethe's appreciation of the *Sakuntala* is known to all scholars through the translation of Mr. E. B. Eastwick (4). Indeed the poet-philosopher was so much captivated by the play that its prelude suggested to him the plan of the prologue on the stage of his world-renowned *Faust*. The celebrated German poet Schiller was so much impressed with the *Meghaduta*, that he could not but apply the idea in his *Maria Stuart*, where the captive queen of Scots calls on the clouds as they fly southwards to greet the land of her youth (Act III. Sc. I.). Alexander Von Humboldt has appreciated 'the richness of his creative fancy, and Lassen cannot but call him 'the brightest star in the firmament of Indian artificial poetry.' M. Hippolyte Fauche considers the *Meghaduta* 'to be without a rival in the whole elegiac literature of Europe.'

The next questions that offer themselves for solution about this poet of such world-wide repute are—when was he born and when did he die? What place did he adorn by his birth and breeding? Who were his parents? How did he live and how did he think? The queries, natural as they are, cannot be satisfied. The poet has observed a painful reticence regarding himself in his works and the details about him are lost beyond hope of recovery. No careful study will ever enable a reader to detect even a passing allusion either to his own person or to any remarkable incident of his life. The evil consequence of this has been that even the jingling rhymes of wretched poetasters, as the *Nalodaya* (5) or the *Jyotirvidabharana* have been fathered upon him.

Tradition has, no doubt, handed down certain stories and anecdotes about Kallidasa. But in them facts and fables have been so strangely and inextricably interwoven, that it is impossible to disentangle the one from the other. There is an old and trustworthy tradition, handed down to us from times immemorial, that Kalidasa flourished in the reign of king Vikramaditya, B.C. 56 (6). But another tradition tells us that he was patronised by a king named Bhoja in the eleventh century (7). Now it is impossible to reconcile these flagrant inconsistencies.

Amongst the antiquarians, too, we find no unanimity with regard to the decision on the date of Kalidasa: (1) M. Hippolyte Fauche supposes the poet to have lived at the times of the posthumous child who is said, in the end of the 19th canto of the *Raghuvamsa*, to have succeeded to the throne. This would place Kalidasa in the 8th century B. C. at the latest (8). Against this date Mr. S. P. Pandit says—(1) "If Kalidasa lived in the reign of the posthumous child, we cannot suppose him to have described his ancestors and said nothing about the living king himself; (2) we do not know for certain that the nineteenth canto is the real conclusion of the *Raghuvansa*. The end of the 19th canto is abrupt; and unlike other works of the poet does not end with a benedictory stanza. Tradition tells us that there is a sequel to the *History of the Solar kings*. (3) From the fact that no more kings are described by Kalidasa it does not necessarily follow that no more kings lived. The *Vayu puran* tells us of seven Kings to have reigned at Ayodhya after the son of Sudarsana; and the other Purans mention 37 princes to have lived after the voluptuous King Agnivarana."

(6) *Kathasaritsagara* pp. 650-651.

(7) In Gujrat, Malava and the Deccan, Kalidasa is believed chiefly on the authority of the *Bhoja-Prabandha* of Ballala to have flourished in the court of Bhoja, the nephew of Munja at Ujjayini in the eleventh century of the Christian era. Mr. Bently, on the authority of the *Bhojaprabandha* and the *Ayin-i-Akbari* supposes the patron of learning to be the same as Raja Vikrama, successor to Raja Bhoja, in the 11th century.

(8) Dr. Bahu Daji's essay on Kalidasa P. 7. S. P. Pandit's *Raghu*, Preface pp. 27-28.

(4) Wouldst thou the young years blossoms and fruits of its decline,

And by which the soul is charmed, enraptured, feasted, fed?

Wouldst thou the earth and heaven itself in one sole name combine?

I name thee, O *Sakuntala*! and all at once is said.

(5) Dr. R. G. Bhandarkar has at last found out the name of the author as रविदेव son of

Again it has been indisputably proved that *Bhavabhuti* belonged to the first decade of the 8th century A.D. Now supposing Kalidasa to have lived in the 8th century B.C., we would have a distance of sixteen hundred years between them. Corresponding to this difference of time, the style of Kalidasa ought to have differed from that of Bhavabhuti's Sanskrit as much as the Vedic differs from the Classical. But almost the same spirit, the same manner of treatment, pervade the productions of both. (II) Sir William Jones places K. in the first century B.C. This date rests on the solid foundation of a tradition of remote antiquity (9) which tells us that King Vikramaditya of Ujjayini after defeating the Sakas or the Scythians established the Samvat era which commences from 57 B.C. Another tradition connects the name of K. with the नववज्र (or nine gems) who adorned the court of Vikramaditya. (10). Here then we have to answer the following queries before we can come to any final decision : (1) Was there a King of the name Vikramaditya who defeated the Sakas and founded the Samvat era in 57 B.C. ? (2) Was he the only King who was called Vikramaditya or was it a title simply assumed by various princes of different dynasties ? (3) Did the नववज्र (or the celebrated nine gems) flourish in the court of that Vikramaditya who established the Samvat era in 57 B.C. ?

The Jaina savant Merutungacharya in the Patavali says that —“ After Nabhovahana, Garddabhilla ruled at Ujjayini for 13 years, when Sri Kalikacharya, on account of violence offered to his sister Saraswati, uprooted Garddabhilla and established Saka kings in Ujjayini. They ruled there for four years. Garddabhilla's son Vikramaditya regained the kingdom of Ujjayini from the Sakas and having relieved the debt of the world by means of gold, commenced the Vikrama Samvat

era. This took place 470 (453+17) years after Vira's era. Vikrama's reign extended over 60 years. His son *Vikramacharita* (*alias* Dharma-ditya) ruled for 40 years. The next kings Bhailla, Nailla and Nahada ruled for 11, 14 and 10 years respectively. The Saka era now commenced 605 years after Vira Nirvana.” (11). From the above statement we learn that there was a king named Vikramaditya who reigned 135 years before the commencement of the Saka era. This is also corroborated by the account given of this Vikramaditya in the *Katha-Sarit-Sagara* (*Nirnaya Sagara Press*, page 651) which is only a Sanskrit poetical rendering of the *Brihat-Katha* of Gunadhya of the third century B. C.

There are, however, several antiquarians, who doubt the existence of this Vikramaditya, as, they say, there is no documentary evidence whatever for his existence in the first century B. C. ; and Mr Fergusson has gone so far as to start the bold theory that what commonly goes by the name of Vikrama era of 56 B. C. was a date arrived at by taking the date of the great battle of *Korur* in which Vikrama Harsha of Ujjayini finally defeated the Mlechchhas in 544 A. D., and by throwing back the beginning of the new era 600 years before that date i. e. 56 B. C. (12). Prof. Maxmuller praises the architectonical genius of Mr. Fergusson & thinks that his theory will at last turn out to be correct (13). Some advocates of this queer theory go so far as to say that the Samvat era which marks the beginning of the foundation of Malava was in existence before Harsha's time under the name of *Malavastitwada* (मालवानित्वाद) and that he only changed its name into *Vikrama Samvat*. This bold theory falls through before the Kavi inscription (14) discovered by Dr. Buhler which gives the date 430 of the Vikrama era Samvat for its grantor Jayabhata. Prof. Maxmuller questions the genuineness of the date given in this inscription (15), but all his

(9) Brihat Katha.

(10) धर्मनरिः चपयकोऽमरसिंहश्च
वेतालभट्टकर्मर- कालिदासः ।

ख्याती नराहमिहरी नृपतेः सभायां

रत्नाणि वे ईरद्विर्गविक्रमस्य ॥—

Jyotirvidabharana.

(11) The literary remains of Dr. Bhaudaji pp. 121-133.

(12) Journal of the Royal Asiatic Society, 1880, on the Saka, Samvat and the Gupta Eras.

(13) India what can it teach us pp. 281-82.

(14) Indian Antiquary, 1876 P. 152.

(15) Maxmuller's 'India what can it teach us' P. 286.

objections have been fairly refuted by Dr. Fleet (16). From the Mandasor Inscription of Malava Samvat 529, Dr. Fleet has conclusively proved the futility of Mr. Fergusson's theory and has shown that Vikrama reigned in Ujjayini in the first century before Christ. With regard to the second question it may be safely observed that there were many Vikramadityas. The Raja-Tarangini makes mention of two Vikramadityas who were the rulers of Ujjayini. The first is spoken of as having placed Pratapaditya, one of his relatives, and the second who ruled about 276 years after, as having placed *Matrigupta*, a great poet, on the throne of Kasmira. (17) The Raja-Tarangini mentions a third Vikramaditya also, who ruled over Kasmira about 592 A. D. (18) Besides, the title of *Vikramaditya* was assumed by many princes of the Chalukya Dynasty. The story of the *nine gems* who are said to have flourished in the court of this Vikramaditya of 56 B. C. rests simply on surmises and is unworthy of historical credence. The only work that connects the *नव रत्न* with the Vikramaditya of the first century before Christ is *ज्योतिर्विदाहरण* with the name of *Kalidasa* as its author. It has clearly been proved by all antiquarians without exception that this work is not the production of the author of the *Raghuvamsa*. Mr. S. P. Pandit calls it a Jain forgery (19). Both Dr. Hall and Dr. Kern believe it to be of recent date. But the tradition that the nine gems flourished in the court of a Vikramaditya is true according to some, because they say that it is confirmed by an inscription found at Buddha Gaya, a translation of which is given by Charles Wilkins; but the tradition that that Vikramaditya was the same as the Vikramaditya, the founder of the Samvat era, is without any foundation. Besides, the description itself is of doubtful character, as the text of it is lost with the stone on which it was incised.

Col. Wilford, on the authority of the *ब्रह्मचर्य-साहाय्य* of the Jain Savant Dhaneswarasuri,

places Kalidasa in the fifth century A. D., and is followed by J. Princep and H. H. Wilson. (20) The Col. says—"In the *ब्रह्मचर्यसाहाय्य* we read that after 466 years of the era are elapsed, there would appear the great and famous Vikramaditya; and then 477 years after him Siladitya or Bhoja would reign." Dr. Buhler calls the *ब्रह्मचर्यसाहाय्य* a wretched forgery of the 12th or 14th century. Besides, the era referred to in the text quoted above, has clearly been shown by the late Dr. Bhau Daji, not of Vikrama, but of Vira (*i. e.* Mahavira or Vardhamana, the last of the Jaina Tirthankaras). Col. Wilford has undoubtedly confounded this Vira with Vikramaditya who is also called *Vira Vikrama*. Both Princep and Wilson are led into the same mistake. Hence it is evident that the *ब्रह्मचर्य साहाय्य* does not help us in the least in the determination of the date of Vikramaditya and his favourite court-bard Kalidasa.

Some antiquarians, although they call the *ज्योतिर्विदाहरण* a Jain forgery, are of opinion that the couplet that unite the nine gems together, must have some genuine foundation and if the date of one of these gems be determined, they can easily determine the date of Kalidasa. The date of Varahamihira, one of the nine gems, being fixed to be the 5th century of the Christian era, they easily fix that time to be the date of Kalidasa. But as there is no positive proof or any documentary evidence to show that *Kalidasa* of the *Sakuntala* was a contemporary of Varahamihira, the statement that contains the couplet becomes in fact quite invalid.

(To be continued.)

U. N. VIDYABHUSANA.

THE EDUCATIONAL IDEAL.

III

To secure an opulent Environment of this character—an Environment which may develop the life principle in each pupil—it is necessary that there

(16) Indian Antiquary vol XII, 1888, P. 263.

(17) Rajatarangini III. pp. 65-70. Bombay Edition.

(18) Ibid. P. 90.

(19) S. P. Pandit's *Raghu*, Preface P. 29.

(20) Dr. Hall's preface to his *Vasavadatta* P. 11.

be intimate personal contact between the teacher and the taught. The student-period of life, must be one not so much of *learning* as of *training*, and the dead letter of books can never communicate that impulse which the living voice of a great teacher can. Knowledge to be humanised must be brought home to us through affections, imagination, the will and the intellect; and this may not be unless the pupil is in contact with a great Life. Education is fellowship; and mind develops in contact with the living mind. Full of meaning is Goethe's maxim "character calls forth character." The young are influenced not by abstract ideas but by ideas spiritually concrete i. e. by ideas which are an expression of the spiritual personality of the teacher. A direct stream of influence flows forth from the teacher to the pupil. So it is that the living voice of a great teacher produces conviction as no books can. External methods of organisation and institutional work can never do what the directness, the freshness, the simplicity and the intercourse of a teacher can. There was the secret of the Hindu System of Education as it prevailed in India. The Hindu was not familiar with "Lascaster" method of signal and orders, of monitors and curious devices to punish offenders—a system which the Edinburgh Review once praised as "a beautiful and inestimable discovery, a plan now brought very near to perfection by which education could be placed within reach of all classes" The Hindu believed in close touch of the teacher with the taught. The Hindu *Ayatana* (College) was one great family and the teacher was an Elder to whom the pupil looked not alone for *instruction* but also for *blessing*; the Hindu teacher encouraged *enquiry* and by the power of sympathy and love drew out the pupil's forces and originality. No teacher can educate unless he is anxious to *draw not* the pupil's personality and this may not be unless the teacher recognises the truth that there must be both *freedom and fellowship* in educational work. The real University, said Carlyle, is a collection of books. Not so thought the Hindu. More than an impersonal collection of books is a personal communion of *mind with mind*; and the object of all liberal education is through this

communion to bring the *mind* into *form*. A collection of books may give you *information*; but as Cardinal Newman has well observed "the true end and adequate end of intellectual training is not learning or acquirement but Thought, Reason, Philosophy."

IV

I am afraid the modern educational method is too *impersonal*! A candidate writes a paper which is examined by a gentleman who has little personal contract with the student and therefore has little knowledge of the individuality of the pupil and the University operates as a machine spouting out year after year the graduates a good number of whom become little better than splendid *do-nothings* so far as the vital needs of the Nation are concerned. The 'neuristic' attitude of the mind is seldom encouraged. The curricula of studies lack any large scheme of 'culture stages'. And our Colleges have become homes of devitalised theories and old ideas, knowledge is not related to the living issues of the Indian life. There is a worship of authority at the Indian Universities; the examination idol is before us; knowledge is divorced from life. Students are anxious to be 'crammed' with miscellaneous knowledge; the teaching staff are anxious to flood the young 'barbarians' with lectures and examinations! Professors are allowed little time for Research. Cheap novels—often of the doubtful type of Kipling—are sought and swallowed in our Reading Rooms. Tit-bits of information are appreciated more than systematic thinking and our young graduates are like Shakespeare's knight with a "mint of phrases in his brain"! Accumulation rather than selection is the controlling ideal of culture. Stale debates concerning History *vs* Literature or Science *vs* Philosophy arouse the interest of our audiences. The great Idea of the University—the Idea of the Unity of all knowledge, the correlation of all sciences, the basal Unity of Culture is ignored; and we hasten to introduce rivalries in the realm of Culture. "We desire" said a teacher once "to give no time to our pupils to *think*". Yes: thinking is prohibited! And the modern undergraduate

breathes a silent wish expressed by a character in Plato's dialogue, the *Symposium*—"How I wish," the student says while listening to the Professor's Lecture "how I wish that wisdom could be infused through the medium of touch out of the full into the empty man, like the water which the wool sucks out of the full vessel into an empty one; in that case how much I should prize sitting by you"! Voltaire in a paper on the "Horrible Danger of Reading" imagines an order of a great being prohibiting thinking: here are the words:—"for the edification of the faithful and for the good of their souls we forbid them ever to read a book under pain of eternal damnation. * * * And to prevent any infringement of our ordinance we expressly forbid them to *think* under the same penalties. * * * Given in our Palace of Stupidity." Alas! the utilitarian view of knowledge is gaining ground in this ancient Land of Culture; and I have no doubt a wrong conception prevails in many quarters of the function of the teacher. There is the story of an Oxford undergraduate who was preparing to go in for his final examination. The young man went to his tutor to discuss with him a problem in metaphysics. The tutor could come to no definite solution, but discussed it from different points of view. This however, did not satisfy the student, "What I want" he said "is the *examination* answer to the question; give it me in a precise form". "I really can't" said the Tutor "it is a point concerning which I can't—and I should n't, speak dogmatically. Honestly I don't know." "Come now Mr—" said the undergraduate "you are *paid* to know."

You are paid to know!—that is the theory of many. The utilitarian ideal of knowledge has crushed the *spirit of reverence* which was the inspiration of student life in ancient India.

We of the teaching profession, blame you—we find it easy to blame you beloved students! alas! we forget that we too must share the blame with you: the Hindu student had the sweet selflessness of reverent youth because he lived in the home of the teacher and because the teacher lived a life of plain living and high thinking. And

a beautiful order of things may still be established in India if the teacher will but live a simple life of purity and love, introducing more of *tenderness*, showing less of *power*, in the rules framed for the discipline of the students,—if he will but recognise the ancient truth that sympathy is stronger than authority—if he will but regard the platform of culture sacred as a shrine where the soul meets souls—if he will but believe that the college teaching is not an industry but an inspiration, that the University is Fraternity, a Brotherhood,—if he will but regard the pupil as a member of his family and believe that where external appliances of education fail, the force of sympathy and the power of suggestion touch the active spiritual force in each pupil's personality. I know not if my voice is the voice of one crying in the wilderness, one thing I know: that you, my beloved students, that you have still the instincts of Hindu idealism, nor have you bartered yet for the glitter of a commercial civilization the spiritual legacy which is yours as members of the great gifted Hindu Race.

I speak these words in no spirit of flattery. The complaint which is sometimes made against me is that I *offend*, not that I flatter. I echo the words of Shakespeare when he says in Richard II. "He does me double wrong that wounds me with the flatteries of his tongue." I do not mean to flatter you. I know modern intellectual education has created an epidemic scepticism in India. I know cheap sensational newspapers are being sought more and more by you. I know that the tide of secularism is rising and threatens to invade the sanctuary of your souls. Polybius complained in his days of how as Rome declined Græcomania affected the Roman—the Romans copied the bad points in the Greeks, their power of pleasure and their idleness. And I know that you are being affected by *Anglomani*!

But I have faith in the Dispensation which has drawn in India in contact with England; and I have faith in the memoir of the Hindu Race. Mr. Townsend and other Western Critics are fond of telling us that the Hindu Race is doomed to mental exhaustion and arrest of original

progress : the Hindu race, is destined at no distant date, I believe, to enter upon a world-ministry for the education of the Race. And I have faith in you—youngmen, you are destined to be the trustees of the Future ; and I have faith in the idealism and instincts of youth. The ancient fire is not yet quenched : and there are converging signs that the spirit of God is breathing to-day a breath from above so that the smouldering ashes may grow again into the glory of a mighty flame which may shine and shine as a time-symbol of India's sacrifice to God.

All over India to-day, there is a talk of National Education ; and I am sure I shall disappoint you if I fail to express my opinions concerning that subject. Time not matter fails me ; time not instances and illustrations. Let me submit a few thoughts concerning the subject.

(1) The modern systems of Indian education are unpsychological, taking little note of the heredity of the Indian people and the contributions of India to World-Culture. A scheme of National Education is necessary to advance the culture of the Nation. Disraeli declared that in such matters we must consult the genius or the people. For it can not be sufficiently emphasised that the University is a trustee of the mind of the people. Progress to be steady must be related to the natural environment of the people ; and sound education must be directed to the needs and demands of the *collective personality* of the Nation.

(2) Hence, India must have the first place in any satisfactory scheme of Education for India. The end of education being self-activity, self-perfection, self-evolution, it is necessary that our national past be not ignored. Historic traditions must not be eliminated ; and our teachers and students must know what is our share in the heritage of the realized wisdom and revelations of the Race. Indian history must be written and taught with the precision of a scholar yet the passion of an Indian patriot. Yet Indian history is sadly neglected by Indians themselves. The remark is sometimes made that ancient India had no history ! and this remark is often quoted by some Indians themselves. Yet the remark is not true.

History is not to be confounded with a record of battles ; the old aristocratic conception of history as concerned with the fortune of beings must give way to the new view of history interpreted as concerned with the People : history is the evolution of the Mind. The truth is, the genius of the Hindu Race is often ignored. How many of you have studied the lives of beings like Janaka and Rama and Asoka ? And Srikrishna himself—was he not a being in the Hindu sense of that word—the father of the people ?

The ethics of Citizenship, again, must be taught through the biographies of India's great men. There is need of new primers, which may give stories of the worthies of modern Ind—of men like Telang, Ranade, Dadabhai Naoroji and Chandravarkar of our Presidency—like Ram Mohan Ray, Debendra Nath Tagore, Keshub Chanda Sen, Rabindra Nath Tagore, P. C. Mozumdar, Dr. J. C. Bose, Dr. P. C. Ray, Dr. Brajendra Nath Seal—of men like Navalrai and Hiranand and Dayaram of modern Sind. In this way alone may the student feel the inspiration of the present and so build up a beautiful character rich in the resources of a lofty idealism. In this way, too, may be created a sentiment—*Indiana*—a pure and lofty patriotism,—teaching the students to look as did the Romans on the Eternal City as the Great Mother, the Mother of the Indian people.

The study of Sanskrit Literature must have a prominent place in the intellectual curriculum of a National University. The poetry and drama of India are pervaded by the triple ideal of Faith, *Sanyasa* and virtue. And the one thing which you will be impressed with is that in Hindu Literature, *romance* is subordinated to *renunciation* to the self-surrender of *service* : love is not represented as *passion* but as *devotion*. How superior is *Sakuntala*—a type of self-renouncing love—to Goethes' *Werther* ! Werther—a man of sentiment—falls in love with a woman who is first bride and then wife of another. His passion consumes him : he commits suicide rather than endure a life of renunciation ! Read again the beautiful story of *Mrichhaktika* inspired by the same *idealism* of love. A few years ago this drama was played at the Royal Court Theatre in

Berlin as well as at the Court Theatre at Munich ; and it roused so great an enthusiasm that the actors were recalled 8 times before the curtain closed ! Think again of Hindu art. The Greek in his art has sought to quench the *will* in the *Beautiful*. Witness for instance the representation of the Cupid. The Hindu has sought to quench the will in the *Sublime* ; The Hindu discerned the truth that the *Sublime* was the one Salvation of will. Beauty cannot quench will : it tends rather to multiplication. Art—Schopenhauer has well observed—must “disengage from will” ; and it never can do so unless it discern the Divine in Nature and man. And it is the revelation of the Divine, the Infinite in the finite, the Sublime in Nature and man, which the Hindu art has sought to depict in diverse ways.

Think again of Hindu music. There is a story told of Prof. Wilson. He wanted to learn Hindu music but was told to be an apprentice for 5 years ! Read the *Sangita Ratnakara* and you will find that the symphony is based on principles of Mathematics. European critics often forgot that Guido d' Arezzo (1000 A. D.) borrowed his gamut from Arabs who got it from the Persians and the Persians were the pupils of the Hindus.

And Hindu thought : you have but to study it to appreciate the shut-in splendours of Hindu philosophy. Dr. Ballantyne confessed that Goutama carried the analysis of syllogism to a greater perfection than Sir W. Hamilton. And the Vedantic view of the Causal Relation is the issue espoused today by some leading thinkers of Europe. Hindu psychology as we find it in the writings of Patanjali and Sankara is a beautiful investigation of what western thinkers of today have called the *Subconscious*.

A new Renaissance of Indian Literature is the need not alone of India but of the world.

(3) But our *national education* must not be *narrow*. The national must not be divorced from the universal. Rosenkranz says strangely : “the National is the primitive system of education,”—as if the *national* and humanitarian are necessarily in conflict ! Our system of Culture for the nation must not ignore but reverently assimilate the Revelations of God to the modern age. Or the

Progress of India would be imperilled. The Good of the whole Race of Man must receive our recognition ; and if we wish India to be great again it is that she may minister greatly as a servant of Humanity. And so science, technics, industry, agriculture, English history, contemporary politics of other nations must be studied so that India's life may be enriched and a counterpoise provided to the weakness of our national temperament. We must take advantage of the modern educational organisation of the West. Sound free libraries must be established in different parts of India. We must provide for classes and Lectures for Teachers to improve their efficiency in special subjects. University classes must be opened to bring the teachers into contact with original workers in different branches of learning. Evening classes and vacation schools must be organised. Polytechnics and technical institutes must be opened :—also Laboratories, museums of antiquities, and research libraries for the *extensive* study of history, anthropology, economics, sociology, law, science, art, ethics, epistemology, metaphysics, psychophysics, psycho-phynology, psychology, comparative theology, the philosophy of science and political history, art-criticism and comparative literature. The faculties of Theology, Law, Medicine, Philosophy, Art, Mathematics, Natural Science and Technical faculties will secure a co-ordination of University and polytechnic and so provide for elements of universal culture as also the practical branches of knowledge. William James has well observed in his “Talks to Teacher :”—“It is impossible to disguise the fact that in the the psychology of our own day the emphasis is transferred from the mind's purely rational function where Plato and Aristotle and what one may call the whole classic tradition in philosophy had placed it, to the so-called neglected *practical side*. The theory of evolution is mainly responsible for this.” The practical side must necessarily be developed to meet the new needs of the Nation. The humanists and the realists must be reconciled. And when the practical and the literary basis are combined, we may expect to have a University which may impart liberal culture and be in the

words of Huxley a "factory of new knowledge". Free education is India's need ; every child must enjoy the opportunity to develop the God-given powers latent in the soul ; distinctions between the rich and poor must vanish in the Shrine of Culture. Education is a national concern ; and every child—an asset of the Nation must be given opportunities of self-culture and self development. Well spoke Victor Hugo "He who opens a school shuts a prison." With free schools, and free libraries and efficient Universities of this kind scattered in different parts of the Indian world, the Nation will enter upon a new period of Expansion—a period of preparation for the ministry of the Oriental Consciousness to the modern world.

(4) Nor must I forget to mention that we must secure a *religious basis* for our education. India has suffered for many years past from soulless education and a large number of India's young men confess the agnostic creed. It is a fashion with some to follow Nietzsche and Bernard Shaw ; and the latter's remark in his play "Maxims of a Revolutionist" is sometimes quoted :—"Not to give your children moral and religious instruction unless you are quite sure they will not take it too seriously". The remark is as dangerous as that other one made by the same gifted writer : "disobedience is the rarest and most courageous of the virtues".

Young men who echo, thus, the opinions of Western writers forget that the trend of thought in the west is still towards a spiritual interpretation of the Universe. Höchel and Spencer and Bushner do not represent the highest thought of the West. Think of Eucken, the foremost German thinker, of Bergson the greatest philosopher of France, of Royce and Ladd the leading exponents of thought in America, of Bosanquet, Bradley and Sir Oliver Lodge in England—and you realise the truth of my statement that contemporary thought in Europe and America points, in its highest reaches, to a spiritual world-view. The soul of India is religion ; and for us to have education without a *religious basis* were to commit national slaughter.

By the word religious, I do mean the dogmatic, the traditional, the ecclesiastical. Recent advances

in science and historic criticism have shown the weakness of all dogmatism. Our faith must be in harmony with the declarations of reason and the moral law. We must avoid the two extremes of dogmatism and secularism, National education must be inspired by religious idealism. I do not mean that we must impose creeds on the student. What I am anxious for is that the teacher should be filled with the spirit of Religion.

And is not the spirit of religion this—to believe that man has kinship with the world spirit, that God is the Root-self of all ?

This truth once apprehended, secures a new co-ordinating principle of life, a new strength and a new illumination for us in our strivings, towards nobler living and purer service. It inspires us with faith in the infinite power and therefore the ultimate victory of good over evil ; it tells us we are not alone in our battle for the right ; it summons us to the unwearied service of the Spirit as our one Captain and Master ; it assures us that the drift of the stream of evolution is to the Absolute Good. The more I think of it the more I feel that India's need to-day is of teachers who have this apprehension of the unseen in the transactions of time. Such teachers will give the world new *asramas*—centres of a new influence for the uplift of the Race. They will pour a spiritual simplicity upon the ways of the student life, they will inspire students with a lofty idealism ; they will build up a new order of the 'Brethren of the common Life', they will re-awaken enthusiasm for *Brahmavidya* as did the wise ones of Ancient India concerning one of whom we read in the Upanishads :—"Svetaketu was the son of Arun. To him said his father 'Svetaketu ! go forth to study the *Brahman*.'" They will give the world universities pervaded not by the passion of partisan politics and sectarian strife but by an atmosphere of quiet thought, freedom, calmness, moderation—those qualities which constitute what Newman called a "philosophic habit." Such teachers—missionaries of Education—working in the spirit of high service shall help India to have her honoured place in the onward march of humanity.

Let me as I close sound again a note often

sounded by me but which I still must sound till there is breath in me.

The new cycle has begun. England has much to teach India; India has much to teach England. The Call of the Time-Spirit is for a cooperation not separation of the two. Remember that in the pangs of the present is being born a new world-civilization which will be at once *spiritual* and *scientific* in its character and comprehension. From India shall come the new spiritual force to lift the world from the passions and unscrupulous ambitions of lower life to that mystical vision of the one Eternal self which alone can secure a true perspective of world-politics and racial relations and so help the nations of the west to enter into a true apprehension of those deeper truths and values of the Christian faith which the dominating civilizations of the west tend to trample upon with the passionate cry of Progress and Power. From England shall come the practical sciences which are destined to press the forces of nature in the service of man unto the glory of God. Remember young men! the responsibility is laid upon you to be the standard-bearers of the great Race to which you belong—the Hindu Race which has through the many ages of its evolution cried with a passionate cry for the Cult of the Spirit.

The late Prof. Hearn—the large-hearted American who taught English at the Tokio University—once asked his Japanese pupils to write an essay on “what is eternal in literature?” And one youngman wrote:—“The eternal in literature is the lives of patriots and the teachings of those who have given pure maxims to the world.” Such the young men who in the growing years of their manhood trained themselves in the school of service and served Japan in her hour of peril. One of these men was Admiral Togo. And of him we read, how when he was a boy he was taken by his mother to the Worship-House; and the mother laying down the little boy offered the touching prayer:—

“Lord! when wilt thou accept him as a sacrifice?”

How many Indian mothers today can pray this prayer? How many of you, young men!

are being trained in the school of service and sacrifice? How many of you are striving for the healing of the wound of the Nation—striving by word and deed to still sectarian storms? How many of you are living the truth that true freedom is self-control and service?

In the day liberal education based on the religious conception of life secures the emancipation of the Indian woman and develops the man—making qualities of Young India, the pressing problems of the Nation will be solved; and the prayer of the pure devoted Indian woman will rise as a rich memorial to the throne of Mercy. Then into Indian bodies shall enter the souls filled with the spirit of Nation-service, and India's sacrifice of ages shall be accepted, and this Ancient Land shall be builded for a Great Future, and East and West shall work together for the world's redemption. Then, ah then! shall the vision of the Indian poet be verified:—

“At last with joyous hearts they looked around;
And saw one world, the world of East and West
Enfolded in each other's loving Arms.”

T. L. VASWANI.

THE PHILOSOPHY OF RELIGION.

Chapter VIII—Religion and Morality.

Religion means a belief in a Supreme being on whom we depend and whom we love and worship and who is the originator and sustainer of the world of finite things and minds; while morality means an effort to attain perfection by regulating action according to a rational standard. Now, what is their relation? Are they interdependent or have they two distant sources? Is it religion that makes morality? The Legal Theory of Morality supposes that the will and command of God make action right and wrong and hence morality. But an action is good not because God wills it, but God wills it because it is good. We must not think that God creates moral standard arbitrarily but moral good-

Religion and
Morality

The Legal
Theory

ness is inherent in God's essential nature. Is it morality that makes religion? Kant represents religion as essentially a sanction for duty. Kant holds that the highest good of man is two fold—morality and happiness, but happiness is often sacrificed for virtue, the desire of happiness is perfectly rational. It follows, therefore, that there must be either a supreme director who will ultimately make virtue and happiness equal or a conscience whose dictates are unjust and irrational; but the latter is impossible and consequently the former is true. Thus, according to Kant, the intuitions and certainties of our moral nature lead us necessarily to the idea, of, and belief in God, and, therefore, to the aspiration to bring our nature and will into harmony with the nature and will of God, which is religion.

Martineau holds that we intuitively feel we are under an obligation to do what is right but obligation implies a person to whom it is due. To what person, then, are all our obligations ultimately due? It cannot be due to man individually or collectively, for indeterminate duties are not due to individuals, and even determinate duties are likely to be waived if they be not ultimately referred to God. Also the rising steps of the moral scale leads us to the idea of God in whom the moral ideal is realised. Hence the idea of, and belief in God. Some hold that religion and morality spring from

Religion and
Morality have
different
Sources

distinct sources of mind: morality has its source in the idea of a perfect self and aspiration towards perfection, while religion has its source in the feeling of dependence and longing for self-preservation. But though religion and morality thus have distinct springs and motives in human nature, such isolation is inconsistent with the essential unity and harmony of mind. Therefore as our moral consciousness develops we find that power and excellence have a common source in God, that the supremely powerful must at the same time be the supremely good.

Chapter IX.—Religion and Art.

What is the relation between art and religion? Art consists in the production of sublime and

beautiful things, such as, buildings, paintings, poems, music etc. There is around us a world of order and beauty, a world in which elements are wonderfully compounded and qualities wonderfully associated—in which there is an admirable regularity, admirable diversity. The contemplation of such beauty of nature raises in our mind the feelings of wonder and admiration, of reverence and love towards the divine power whom we suppose to be the author of this beauty. Thus the beauty of nature excites our religious feelings which we manifest by producing, in imitation of the beauty of nature, such beautiful things as buildings, paintings etc. to express our gratitude wonder and admiration towards God. The grandest buildings, the most beautiful paintings, the noblest music, the greatest poems are religious. Any art which can elevate and improve the mind has been directly or indirectly engendered by religion. Art of a high and healthy order has ever drawn its inspiration largely from religion.

Religion ins-
pires art

CHAPTER X.—History and Religion.

Does History contribute anything to Philosophy? Some Sciences are independent of history e. g. Astronomy, Chemistry. We can learn everything which Chemistry or Astronomy has to teach without the history of the processes by which its knowledge has been attained. There are some sciences which depend on history e. g. Biology, which is an historical science—a perfect biology means a perfect history of the origin and development of living beings. Mind also depends on history because it develops and all its stages, present and past, are related to each other and can be understood only in relation to each other and therefore in connection with their growth and development. What is Philosophy? It is the product of mind and it has gone on developing with the development of mind and hence a perfect philosophy would be a perfect history of the origin and development of the system of organically connected ideas. The history of philosophy is nothing but philosophy itself. To know philo-

History of
Religion and
Philosophy of
Religion
independent

sophy is to know it as it grows and develops. It is the history of its development that exhibits to us all its organically connected phases and factors. Religion too is the product of mind and hence it has gone on developing with the development of mind. Therefore it is the history of religion that can best help us theoretically to understand what religion is. Does philosophy contribute anything to the History of Religion? Religion helps to interpret history which in its turn helps to form a true speculative idea of religion. A rational theory of religion helps to interpret and understand history of religion which may either form an erroneous conception of the primitive and lower forms of religion or altogether deny them the character of religion. True philosophy will teach us that the lower religions are a gradual awakening to the idea of the Infinite.

CHAPTER XI.—Origin of Religion.

The history of religion helps us to trace the development of religion and the theory of religion which we form out of such study depends on the philosophy of religion with which we begin to investigate it. Thus we see that De Brosses, Comte and Tylor hold that the feeling of causality in man made him rise from worship of mundane to supramundane objects as cause; and the crossing of fetichism and the spiriticism which had grown up gave rise to monotheism. Man has a natural tendency to look for a cause for every change in the universe; at first he assigns this vague feeling of causality to the nearest objects of observation which some way or other arouses his curiosity, or fear or hope. Thus he at first worships stones and mountains and rivers and animals or even men—and these become his fetiches. Then his attention becomes directed to supramundane objects—the sun, the moon, the stars, and thus the heavens become his supreme fetich. But he cannot rest satisfied with the worship of the visible objects and hence he directs his attention to supersensuous being and his worship of spirit makes him acquainted with such a being. Thus at last he places a supreme God above the highest visible fetich as the author of all.

Thus according to these philosophers religion develops from fetichism to monotheism. But how can spirit worship be at once the result of, and anterior to the worship of the Highest Fetich? Spencer, Caspari and Le Bon hold that the worship of ghosts by primitive men is gradually transformed into the developed forms of worship and for every holy rite there is a corresponding funeral rite. "While primitive men regarding themselves as at the mercy of the surrounding ghosts try to defend themselves by the aid of the exorcist and the sorcerer who deal with ghosts antagonistically, there is simultaneously adopted a contrary behaviour towards ghosts—a propitiation of them. But of this motive and observances come all forms of worship.—

- (a) "Awe of the ghosts makes sacred the sheltering structure for the tomb and this grows into the temple, while the tomb itself becomes the altar.
- (b) "From provisions placed for the dead, now habitually and now at fixed intervals, arise religious oblations, ordinary and extraordinary, daily and at festivals.
- (c) "Immoltions and mutilations at the grave pass into sacrifices and offerings of blood at the altar of a diety.
- (d) "Abstinence from food for the benefit of the ghosts develops into fasting as a pious practice.
- (e) "Journeys to the grave with gifts become pilgrimages to the shrine.
- (f) "Praises of the dead and prayers to them grow into religious praises and prayers"

Schelling, Max Muller and V. Hartman hold at first there was a vague belief in God not yet definitely considered as only or many; then came polytheism and then came its negation monotheism. Hume, Voltaire and Dupuies maintain Polytheism to be the starting point of religion and Tholuck, Ulrici and Caird assert that religion begins with Pantheism. But the above theories are merely conjectural. At this advanced stage of knowledge, it is not possible to determine, by the help of Historical Method, the primitive forms of religion.

Hence according to Crenzer, Prof. Robinson and Canon Cook the best method is to classify religion in the order of their gradual complexity and logical dependence. Thus the ruder religions may be thus arranged : Naturism, the worship of natural objects ; animism, in which the idea of the soul behind the natural objects becomes explicit ; Spiriticism, in which the souls worshipped are human ; Polytheism, the worship of divine individualities ; Dualistic conception of the divine ; and lastly Monotheism. The Jewish, Christian and Mahomedan are monostheistic religions and they entirely transcend a plurality of Gods. Fetichism, Image-worship, Totemism, Shamianism and Sorcery should not be regarded as distinct phases or logical stages of religious development—they are the adjuncts and incidental perversions of religion.

So far as regards the historical origin and development of religion. The theories regarding the psychological origin and the essence of religion are equally numerous and divergent. The atheists of the 18th century held that people invented religion to deceive their followmen and thereby to further their own selfish and ambitious views. Hence according to them religion is the invention of selfish individuals. Fenerbach, Lange, Spencer and others maintain that religion is the product of imagination arising from the misinterpretation of phenomena, ordinary or excecptional. Some zealous supernaturalists maintain that primitive revelation is the only source of religion. Others hold that it rests entirely on intellect. Religion, as we have seen, can not rest entirely on religion, for, the measure of religion can not be the measure of intelligence. Hegel has been wrongly accused of identifying religion with thought ; he did never identify religion with thought but only emphasised strongly the importance of thought in religion. The principle of causality has been regarded by Peschel as the root of religion ; and Max Muller regards the perception of the infinite as the root of religion. The principle of causality and the perception of the infinite are the intellectual principles of religion, but

these principles cannot be regarded as the cause of religion—they are its conditions only. They, who hold that we know God intuitively, perceive Him directly and apprehend Him without medium, assign the origin of religion to intellect but their assertion will not stand the test of psychology and history. Religion has sometimes been resolved into feeling. Thus Lucretius, Hobbes and Strauss trace it to fear ; the followers of Ritschel to desire—desire to secure life amidst the uncertainties and evils of earth ; and the disciples of Scheliermacher to the feeling of absolute dependence, the feeling of pure and entire passiveness. Kant represents religion as essentially a saction for duty.

Thus we see that religion is an inexhaustible field for psychological study. All these views are both true and false—true when they are taken collectively and false when distributively. Each of these views has some truth in it when it is considered in relation to the other and each of them is false when it is taken in isolation from the rest, when it assumes itself to be exclusively true. It should be remembered, as we have seen in the beginning of this essay, that the whole nature of man has been formed for religion and is engaged and exercised in religion. An analysis of the religious conciousness will make it more clear.

Chapter XII—Religious Consciousness.

To which of the departments of mind feeling, thinking and willing—does religion mainly belong ? The seat of religion has been placed by some in intellect, by others in the affection and by others in the will. What is the fundamental constituent of religion then ? Is it exclusively a matter of feeling ? An appeal to popular conviction as well as an appeal to science will make it evident that feeling exclusively is the seat of religion. It is the popular conviction that knowledge can and faith cannot be acquired ; faith is the thing of the heart and is the essence of religion. Moreover, religion is universal and so is feeling, but a high degree of intellect is possessed by the few only. If intellect be the

Psychological
origin of
religion

The seat of
Religion feel-
ing, thinking,
or willing ?

essence of religion, then how can it be universal which it is? An appeal to Science will assert the same truth: Religion means communion of the human mind with the divine, and communion with God can take place only through feeling, for, in feeling the object reveals itself in the mind, and not through knowledge which implies an external object, an object which is known, and the subject which knows the object. But though feeling is an element, it is not the essence of religion, for, mere feeling without knowledge would not know itself to be religion. How am I to know that this and not that feeling is religion? God is eternal and unchangeable; feeling is the most changeable and superficial aspect of our nature; how then, communion of God, unchangeable and eternal, is possible in a thing, changeable and superficial? Some have represented religion as consisting essentially in knowledge and others in volition but we have seen before that neither the one nor the other can be regarded as the essence of religion.

Those who maintain that feeling or willing or knowing is the essence of religion, do not mean of course that the other two factors have no place in religion. Thus, those who maintain that feeling is the essence of religion hold that feeling is religion, knowledge is antecedent to religion and practice is its consequent; those who assert that the essence of religion is knowledge, hold that knowledge is religion and it is the ground of feeling as well as of practice; and those who affirm that practice is the essence of religion maintain that knowledge gives rise to feeling, but this feeling is not religion, it is religiousness, it is the capacity of being religious, and knowledge and feeling together give rise to action which is religion. Thus we see that some make the essence of religion consist in feeling, others in knowing and others in willing. The truth is that religion belongs exclusively to no one part or province of mind—but embraces the whole mind—the whole man.

Chapter XIII.—Psychology of Religion.

As regards the Psychology of Religion also opinions differ. Thus there is the religious instinct

Religion is a Superinduction or internally rooted?

view which holds that religious motive is due to innate prosperity and hence unanalysable. The Intuitionists and the Intellectualists hold that the idea of God is an intuition but admits of proof and hence religion consists in belief based on argument or faith resting on authority. The Analytic and Critical point of view asserts two different conclusions from an analysis of the developed religious sentiment—that of Kant, the Rationalist, according to whom the essence of religion consists in the idea of God as regulator of our Practical Reason; and that of Schellermacher, the Emotionalist, according to whom the intellectual element is absent in religion which consists only in feeling of dependence upon and reverence and awe towards God. The anthropogenetic view treats religion as a great field of historical evolution. The anthropological study, by recognising the essentially religious nature of primitive rites and cults shows what is common to low and high religions alike and confirms that religion consists essentially in certain emotional and volitional attitudes which ideas of various objects may call forth; that the objects of religious veneration have a symbolic value only, for, grander and more imposing objects are regarded as fit objects for worship and cults, religious institutions, ceremonies, sacrifices etc. are only attempts to bring the inexperienced higher something into experience; that religion is a social phenomenon, for, 'no man is religious by himself, nor does he choose his God, nor devise his offering, nor enjoy his blessing alone'—all these depend on social custom, convention, law &c.; that the object of religion consists in personal form whatever that may mean at the stage of evolution now reached or then—the theory of Animism, the Ghost Theory, the theory of Ancestor Worship and all other theories recognise and aim to formulate this form; and that religion arises from the natural demand of man, of more culture and of less culture, for a "more-than-I". "The gods are not experienced objects, they are objects fit for dependence, faith, reverence and awe. This fitness or value is pitched higher as man develops and finds his experience reduced to objects obeying law

The God is ever the something behind the cloud, some one behind nature—the Great One who makes law and works his will for his own, for ours, for a priest, for a Redeemer's sake. And cults, religious institutions, ceremonials, sacrifices &c. are attempts to cope with this unexperienced higher something; to bring into experience for satisfaction, help, salvation that which cannot be found by sense or grasped in knowledge."

Chapter XIV.—Classification of Religion.

The classification of religion also presents no less difficulties. It has been variously classified into—true and false, natural and revealed natural and positive, individual and national religions, religions of savage and of civilized peoples and book religions and religions not possessed of books. But it is obvious that such classification is inadequate and unsatisfactory. Max Muller holds that the classification of religion is the same as that of language and Maurice Vernes is of opinion that religion should be classified according to races. The classification of language as Max Muller holds or the classification of races as Maurice Vernes holds may correspond or coincide with that of religion, but instead of aiming at a complete accordance of religions and languages or races we should aim to study the true nature of religion and classify it independent of language and race, and we must not lose sight of the fact that there are universal religions quite independent of language or race.

Hegel suggests the following classification of religion corresponding to the different stages of humanity as well as of the historical realisation of religion :

A. Religions of Nature, in which no division has yet been made between body and soul, world and God but things are regarded as concrete realities in which physical and spiritual are as yet undifferentiated.

These religions correspond to the childhood of humanity. These religions include Immediate Religion, Pantheistic Religion and Religion which tends to freedom. Immediate Religion, again, comprehends Sorcery or Religion of Magic in

which there is no real understanding of the law of causality as implying proportion between cause and effect,—in which personal beings are imagined who are constantly exercising powers for the good and evil of men and men themselves are always trying to obtain and exercise such magical powers; and it also comprehends Fetichism which consists in the belief that magical powers are seated and concentrated in particular objects such as stones, trees, rivers &c. and that by the proper use of them magical results can be produced and the improper treatment of them will give rise to mischievous results to men. The Pantheistic Religion comprehends the religion of measure or of proportion (China), the religion of phantasy or imagination meaning thereby the metaphysic of substance and phenomena, Reality and Maya, Brahman and the world (Brahmanism), and the religion of being-in-itself (Buddhism) which transcends even the distinction of substance and phenomenon and deals with what is the ultimate identity of both. Religion which tends to freedom is exemplified in the religion of the good or of light (ancient Persian), in the religion of sorrow (Syrian) and in the religion of mystery (Egypt). The religion of light prepares the way for the distinction between Spirit and Nature, Soul and body, God and the world. This form of religion is exemplified especially in the Zoroastrian religion of the Persians which conceives the history of the world as a struggle between Light and Darkness representing good and evil—the good power always struggling to overcome the evil.

B. The above religions are called Natural because they make no attempt to draw a distinction between spirit and matter, soul and

body, world and God. Next we come to another class of religions, known as the Religions of Spirituality in which a distinction is made between mind and matter, world and God, soul and body and which supposes that one can exist without the other. Therefore such religions may be called dualistic or pluralistic. They answer to the youth of humanity. Such religions are manifested in the religion of Sublimity (Hebrew), in the religion of Beauty (Greek)

Views of
Maxmuller,
Maurice Vernes
Hegel and Tiele

Religions of
Spirituality

Religions of
Nature

and in the religion of the understanding (Roman). The religion of sublimity supposes God to be sublime, raised high above the world—God creates the world, but for the most part keeps himself aloof, leaves the world to itself; watches its processes and proceedings and interferes every now and then in the way of miracle to set things in order. Such religion may be regarded as Monotheistic Deism. In Greek religion, known as Hellenism a clear distinction is made between soul and body, Spirit and matter, God and the world; but it splits up the absolute spiritual reality into a plurality of divine spiritual beings, each of which rules over a particular department of nature, represents a particular aspect of character in isolation from one another. This form of religion gave rise to mythologies in the most imaginative and poetical forms, embodying abstract meanings in concrete pictures which is the essence of poetry. Hence Hegel calls it the Religion of Beauty

C. Then, there is the Absolute or Christian Religion, answering to the manhood of humanity, which unites the abstract monotheism of Judaism—which abstracts the world from God—with a plurality of functions which make it possible to conceive, soul and body, spirit and matter, God and the world as ultimately one substantial reality.

Prof. Tiele classifies religion into two classes—Nature Religions and Ethical Religions. Nature Religions comprehend Polydæmonistic magical religions, Therianthropic Polytheism and Anthropomorphic Polytheism. Ethical Religions include, national nomistic religious communities—Taoism, Confucianism, Brahmanism, Jainism, primitive Buddhism, Judaism, Mazdaism and Mosaism, and universalistic religious communities—Islam, Buddhism and Christianity.

Chapter XV.—Theology.

Thus far we have dealt with the nature, origin, development and classification of religion. But religion itself is founded on and supposes Theology or Theory of God. Theology is a doctrine as to the divine

nature and operation. It is that part of the philosophy religion which treats systematically of God, his nature, his attributes and relations and the grounds and limits of our knowledge of him. As theology presents us with a theory of the world as a whole without which a true theory of God cannot be formed, it is really a kind of Philosophy. But there are two methods of Theology—Natural and Revealed. By the former method we apply our natural powers of mind to the world of things and minds as presented in experience, draw inferences from the world of experience, and reason to the ultimate power or powers manifested in the world. This, then, is essentially the method of science and philosophy. Hence Natural Theology may be regarded as a branch of philosophy. But the latter bases Theology on revelation, on some principles revealed directly by God to man and thereby makes it independent of the exercise of human reason and philosophical investigation.

The word Theology first occurs in Plato and Aristotle who understand by it the doctrine of the Greek Gods and their relation to the world; evangelists of the third and fourth centuries used it as the doctrine of the deity of the Logos; and the scholastics understood by it the whole complex of Christian doctrine.

Theology also has been variously classified. We have seen that theology is either Natural or revealed. It is Natural when it is discoverable by the light of reason alone and it is Revealed when it is based on the study of divine revelation; it is Exegetical or Biblical when it is based on the interpretation of the Holy scriptures, when it is a systematic exposition of the christian doctrine, when it arises out of rational construction to the content of Christian revelation; it is Apologetical when its business is to defend Christianity; it is Historical when it is concerned with the historical study of religion; it is Practical or Moral and lastly it is Dogmatic when its ultimate appeal is to authority of scripture and tradition.

Theology as the doctrine of God, the father, should be distinguished from Christology, the

The Absolute Religion

Tiele's Classification

Classification of theology

Philosophy and Theology—Natural and Revealed.

doctrine of the Christ; from Pneumatology, the doctrine of the spirit; from Anthropology, the doctrine of man; from Soteriology, the doctrine of redemption by incarnation and atonement; and lastly from Eschatology, the doctrine of rewards and punishments in future life.

(To be continued.)

C. C. SINHA

SPECTRUM ANALYSIS AND ITS CONSEQUENCES.

When a ray of sunlight is allowed to fall on a prism placed inside a dark room a rainbow coloured image is seen due to dispersion of light. This coloured band of light is our familiar spectrum.

The colours are ordinarily refracted or bent in the following order in glass prisms, first red and finally violet. The following line might be remembered for the colours :—

"Remember of yonder glorious bow in view" in which the initial letters give the hint of the colours, "R" for red, "O" for orange, "Y" for yellow, "G" for green, "B" for blue, "I" for indigo and "V" for violet.

But we are not certain that in our spectrum if any two of the colours are blended. To get a pure spectrum a narrow slit, a parallel pencil of light, a prism in the position of its least deviation to catch these parallel rays are to be adjusted for.

When such a pure solar spectrum is examined minutely it is found to be interacted with a number of dark lines which have their relative positions fixed and they are known as Fraunhofer's lines.

A pure spectrum can now-a-days be obtained by means of a diffraction grating.

A solar spectrum extends beyond red and also beyond violet—its visible limits and there portions are respectively the ultra red portion rich in invisible heat rays which cause the phenomenon of calorescence and the ultra violet portion which is rich in chemical or actinic rays, the cause of fluorescence. The visible part gives rise to phosphorescence.

The spectrum of an electric light is like solar spectrum and it has only this difference that there are no dark lines or bright ones in it.

If different metals be ignited inside the electric arc lamp and if the spectra of these metallic incandescent vapours be examined by means of spectroscope—they one and all mark and stamp their individuality on their spectra and a minute quantity which will be hopeless for a chemist to weigh it will be enough to cause the spectrum to shine with its own characteristic spectrum under similar circumstances.

Thus arose the branch of modern research of spectrum analysis. Bunsen and Kirchhoff found that principle of selective absorption is applicable in solar spectrum and that sun has an atmosphere or photosphere where most rays are almost absorbed, and some of the colours are wanting and thus dark lines are accounted for.

The researches of Father Secchi, Jansen and Lockyer have revolutionised modern thought about the constitution of sun, stars, nebulae, comets and other heavenly bodies like shooting stars.

Auguste Comte in his Positive Philosophy made an assertion to the effect in 1840 or at such period that chemical constitution of heavenly bodies can never be positively known, but his assertions are now not at all accepted by the scientific world.

The application of Doppler's principle in explaining the displacement of bright or dark lines in the solar or stellar spectra leads to the discovery of their relative motion to our earth.

Many new elements are discovered by the workers in this branch of investigation and many of the rare earths even when incandescent solid give rise discontinuous spectra characteristic of gases.

The general view in 1860 was—"one element one spectrum" but in 1865 when Plucker and Hittorf announced that different elementary substances when differently treated give rise to entirely new spectra in each case and even compounds as Mitscherlich found in 1864 when raised to incandescence "give a spectrum special to the

compound, i.e. they have a spectrum of their own; no lines of either constituents are seen."

The hard stubborn facts caused chemists to think whether elements are really unchangeable in their nature under all circumstances.

In 1873 Lockyer investigating on the reversing layers of sun and stars came to understand that there is "celestial dissociation" which prevents the atoms from coming together and this coming together of atoms, at the temperature of earth and at all artificial temperatures which can be obtained here on earth, composes the metals, the metalloids and compounds.

The conclusion which now gradually dawns before the student of science is that all the various so-called chemical elements may be built up in some way of the same fundamental substance; and this conclusion is supported from other physical researches.

J. N. SEN.

STUDENT'S SECTION.

WHY DO THE LUNGS AND THE HEART NOT HAVE SIMILAR REGULATING MECHANISMS.*

In this paper I wish to give out some of the suggestions which occurred to me as answers to the question: Why do the lungs and the heart not have similar regulating mechanisms?

To my mind it seemed to be matter of great curiosity why the two similar organs, the heart and the lungs, possessing allied functions and resembling each other so closely in the broadest outline of their plan of work, should differ in some minor points.

Both the organs exhibit rhythmic activity; alter-

nate contraction and dilation is the phenomenon exhibited by both. But the rhythm of the heart is the property of the muscle, while that of the lungs is the property of the respiratory centre. The cardiac muscle is itself rhythmic, so even an excised heart will beat. But the lungs will stop its rhythm, the respiratory muscles will cease their activity, the moment we either injure the vital node in the medulla, or sever the nervous connection of the latter with the respiratory muscles.

Why is this so? What is the reason that the Great Engineer has built the two organs after such dissimilar patterns?

Or should we ascribe this difference to a matter of accident only, and try to explain it in the same manner as we would do if we be called upon to give reasons for the difference between a palm tree and a mango tree?

Let us hope that it is not so. Let us not imagine that the difference which observe in the mechanisms of the lungs and the heart is the outcome of a self-pleasing whim of our Constructor.

The more we study of the Body, the more we are convinced of the truth that every unit of the body has been set with the greatest skill and discretion, and any change in its condition will not improve but lower the value of the Human Mechanics,—that all the parts of the body are best disposed in their present condition.

I shall refer to some instances in support of this. Behold the long hollow bows of the arm and the leg. Do you think that they are *hollow* for no reasons? Oh, there the highest intellect has come to play, there use has been made of a well-known principle of Rigid Dynamics, which will tell you that with the same quantity of matter a *hollow* cylinder presents greater tenacity than a *solid* prism:—

It is the principle which the engineers make use of in the construction of the pillars for a bridge, and it is the principle which has here secured harmony between the rigidity of the bones and the lightness of the body. Any alteration which may be proposed will interfere either with the rigidity of the bones or the lightness of the body.

* A paper read before the Biological Society of the Presidency College, Calcutta, under the presidency of Prof. S. C. Mahalanobis B. Sc. (Edin) F. R. S. E., on the 15th September 1910.

I have studied some problems of Circulation, but everywhere the same experience came to me. Torricelli, from his theoretical considerations, concluded that the flow of a liquid out of a cylinder will have the maximum velocity, if the orifice is bell-shaped, parabolic in section, so as to imitate the form of vena contracta. Now precisely the same forms of orifice have been found by Nicolls to exist at the junction of a main artery with its branches:—the ingenious experiment by which Nicolls arrived at this truth will never be forgotten in the science of physiology; a stream of molten wax was made to circulate through the arteries, and when the wax solidified, section of the arteries were cut at their points of bifurcation, and studied microscopically.

The investigations of Hamel have afforded another curious result which no one expected, and which the physiologists have not yet been able to account for, but still which clearly illustrate that what *has been* is the best which it *could be*. Mechanics has partly answered the question of the superiority of the *intermittent* mode of cardiac out flow over the *continuous* mode of flow. But the fact cited by Hamel thoroughly establishes it. He has seen that if a *continuous* stream of normal saline be made to flow through the heart under the usual pressure, the result will be considerable oedema of the heart which will effectually diminish the cardiac output.

Reverting now to the question at our hand, let us see if we can show in a similar manner that the difference between the cardiac and the pulmonary mechanisms is a matter of necessity.

In the first place we see that *the process of respiration requires a nicer adjustment than that of circulation*, i.e. the calls for the alteration of the rate and the rhythm are more frequent with the lungs than with heart.

Both the processes have indeed to keep pace with the tissue metabolism. The increased activity of the body would necessitate and acceleration of both: the heart will now have to make arrangements for a quicker transport of oxygen from the lungs to the tissue, and of carbon dioxide from the tissue to the lungs and the lungs must facilitate a

quicker supply of oxygen and a quicker removal of carbon dioxide. How the two organs are spurred to increased activity, we need not consider here. Suffice to say, that they are excited in different manners, but react in the same way.

Similarly the diminished activity of the body would mean a slackening of the action of both the organs.

So far the two organs have got to behave alike. But there are many other circumstances which would affect the respiration alone. A greater number of factors would regulate the respiration than the circulation. The very nature of the phenomenon of respiration requires that it should be under the control of the *will*. Respiration,—by which term I shall all throughout mean external respiration,—involves a connection between the body on one side and external world on the other; it is not like circulation a purely *internal* process. And this intercourse with the external world requires that respiration should be associated with a certain amount of *discretion*, just as our boys who have to mix with the complex outside world, have got to be more judicious than the girls whose affairs are confined within the four walls of the house. For example, we may be thrown into a bad atmosphere; and there will then be the necessity of our ceasing the respiration. Again occasion may require us to enter into the water, and then we must have to take a long breath before we take a dive.

These and some other consideration will show that *respiration requires a nicer adjustment than circulation*. This means that the central nervous system whose function it is to adjust and harmonise all the parts of the body has to be more grossly busy with the affairs of the lungs than of the heart.

In fact, the work of the lungs involves a constant reference to the central nervous system, while that of the heart may be broadly left to itself.

The central nervous system therefore keeps the lungs under its direct control, taking upon itself the task of originating its rhythm:—the heart, on the other hand, is vested with an automatic power of its own, and unless specially

required the central nervous system does not exercise its power over it.

A simile will clear out what I mean.

The central nervous system is, as it were, the paramount power ruling the body under one umbrella. But while every organ is its dependent, some of the organs are given a greater amount of independence than the rest, just as in British India we find that while some provinces (like Bengal, Madras, Bombay &c.) are directly governed by the State, there are others,—the Native kingdoms,—whose general administration is left over to their respective native chiefs, and is only under special circumstances interfered with by the Power Supreme.

The two kinds of kingdoms here referred to resemble the two organs, the lungs and the heart. As it will be seen in the case of kingdoms, so here also, those organs which involve frequent reference to the head power are placed under the direct control of the latter. Thus it is that the lungs depends for its rhythmicity on the central nervous system, while the heart has an automaticity of its own.

Further it will be seen that the *direct* control of the central nervous system over the lungs ensures a *more efficient regulation* of the respiratory acts. The central nervous system is now better able to manage the process of the lungs, just as in the case of a lift-pump we notice that the pump which the operator works by his hand can be more efficiently regulated by him than one which is driven by a machine.

So far I have been trying to show that the observed difference between the cardiac and the pulmonary mechanisms is necessitated by the respective purposes which they are expected to serve.

In this direction, I must frankly confess, I have succeeded but little; I have not been able to give any clear reasons for the difference referred to; and the few suggestions which I have offered have very little force to claim; but still I have ventured to publish these little suggestions in the hope that they may start up new thinkers in this direction.

The last suggestion which I have got to offer is embryological. It is an attempt to show that under the usual scheme of the development of the individual, the heart and the lungs could not have their mechanism otherwise. The heart could not but have been itself rhythmic, and the lungs could not but have been dependent on the nervous system for its rhythmicities.

We observe in the first place that the embryonic heart is called upon to do its functions before the central nervous system is properly developed, and before the cranial nerves appear.

A look at the chronological chart of the development of the embryo will reveal that the heart appears in the 2nd week, the primary circulation begins in the 3rd week, and the heart becomes a regular four chambered cavity by the end of the 4th week, while the cranial nerves appear even after that, and a long interval must elapse before the central nervous system becomes properly developed.

How could the heart, under these circumstances, have been able to execute its functions unless it had an automaticity of its own?

The lungs on the other hand, though appearing in the 4th week, does not commence its activity till after the birth, so it can afford to depend on the nervous system for its rhythm.

And it had no other course left to it. For if it had been automatic like the heart, it could not do otherwise than beginning to pulsate even in the mother's womb, since nothing of the nature of the nervous inhibition can happen now when the nervous system is so immature.

But these attempts at respiration are sure to be fruitless for no direct communication now exists between the lungs cavity and the outside atmosphere. The embryonic lungs will then have to encounter an amount of resistance which will be too enormous for it. Add the result will be that a bursting or damage of other sorts will befall the frail young lungs.

Thus what has been is always for the best; what is God's will is always for our weal. What He has made of us is the best which any one could do us.

Far above our power is to even think of scanning His purpose. But the study of mankind which is certainly Man's, reveals that everywhere His purpose is holy, everywhere it is benevolent. Physiology, no less than the Bible, is a song of His Majesty; the study of Physiology is not less sacred than that of the Bible. Physiology is a mute Bible. Let Physiology be the pursuit of mankind.

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NATURAL HISTORY SECTION.

BOTANY.

MOVEMENT OF PROTOPLASM.

No student of Natural History should fail to observe this most interesting phenomena. Materials for this study abounds in India. We append herewith a list of these and the modes of using them so that the students and teachers may make a selection from them.

(1) *Valisneria Spiralis*. This a monocotyledonous submerged water plant found plentifully in our tanks. There are a large number of them in the College Square tank; the Calcutta students may easily collect them. The plants are about a foot in length. Leaves are flat, base sheathing. Flowers are developed from a spiral long thin axis. Most of the cells composing the leaves show the phenomena of movement of protoplasm. The epidermal cells of the leaves are generally dead therefore no movement can be seen in them. In making a suitable preparation, with a sharp razor make a flat section (about $\frac{1}{4}$ " \times $\frac{1}{4}$ " size) through a fresh and vigorous leaf. Place the section over the slide with epidermal side downwards. The section need not be very thin, the cells being transparent there won't be much difficulty in observation. Examine the section first with the low power. Some of the outer cells may be dead owing to the razor passing through them. Focussing up and down you will be able to see here and there some sort of commotion in the oval and green chloroplasts of the cells. Bring the spot under the objective and examine with the high power of the microscope. You will find that the leaf is composed of brick shaped cells with a large clear space (vacuole) in the middle and thin layer of protoplasm containing a large number of chloroplasts surrounding the vacuole and surrounded by the highly refracting cell wall. The chloroplasts will be seen to be moving in a definite direction round and round the cell. This sort of protoplasmic movement is known as *rotation*.

(2) The other kind of protoplasmic movement namely circulation can be easily seen in the staminal hairs of *Tradescantia* a monocotyledonous plant of the natural order commelinaceae. These showy plants are generally found in our city gardens. We have tried with some of our common village *Commelina* but failed to notice any movement due to the presence of a colouring material in the cells. The directions generally found in Practical Botany Text Books of tearing a few staminal hairs of *Tradescantia*, we have found are seldom profitably utilised by junior

students. In the operation they generally injure the cells in such a manner that no movement can be seen afterwards. We advise them to cut a stamen longitudinally into several pieces; and each bit with a few hairs attached to it may be mounted in water and examined. The small bit of stamen left prevents the hairs from being injured either by the needles or by the pressure of the cover glass; but it must not be too thick, in which case there will be difficulty in using the high power. For a description of the movement the students are referred to their text books.

We have found similar movements in the young hairs growing on the young stem and branches of various cucurbita plants. These may also be profitably used for the purpose.

N. C. B.

HYGIENE SECTION FOR STUDENTS.

[In this section we shall quote eminent authorities about Hygiene, so that the students may be directly benefited by their advice.]

CONSTIPATION.

Dr. Leonard Hill says in his *Manual of Human Physiology*:

Regular action of the bowels is of the utmost importance, for otherwise poisonous products are absorbed which arise from bacterial fermentation, of the faeces. The absorption of such leads to ill health.

The natural purgative cellulose is to be obtained by eating fruit, brown bread containing the husks of wheat, and coarse oat meal porridge for break fast. A glass of cold water before breakfast is also of value; constipation is usually a sign of general lack of tone and shows that the body requires to be braced up by vigorous muscular exercise.

N. C. B.

PROBLEMS.

[N. B. This section is devoted to problems in MATHEMATICS and other subjects. Students are expected to send in solutions to the elementary ones especially.]

ELEMENTARY.

15. The inscribed circle of a square $ABCD$ touches the side AB at E . From the middle point of AE a tangent is drawn to the circle

and is produced to meet CD produced in F . Show that DF is equal to the radius of the circle. —*London Matric. Sept. 1911.*

16. ABC is a triangle, D a point on the side BC . Show that if AC^2 is greater than $AD^2 + DC^2$, then AB^2 is less than $AD^2 + BD^2$. Show also why if D is the middle point of BC , the excess in the one case is equal to the deficiency in the other. —*Ibid.*

17. If $ABCD$ is a cyclic quadrilateral prove that the rectangle contained by the diagonals is equal to the sum of the rectangles contained by the pairs of opposite sides. If in the diagonal AC a point E is taken so that AE is a fourth proportional to BD , AB , CD , prove that CE is a fourth proportional to BD , AD , BC . —*Lon. I. Sc., 1910.*

18. Prove that it is possible to place place two similar triangles with their corresponding sides parallel, so that the lines joining corresponding vertices meet in any given point O . Construct a triangle equal in area to a given square and similar to a given triangle. —*Ibid.*

19. Sketch the graph of $y = \sin x + \sin 3x$ from $x=0$ to $x=2\pi$. Find all the values of a less than 360° which satisfy the equation $\sin(3a+30^\circ) = \sin 2a$. —*Ibid.*

20. A sphere is inscribed in a cone so that a diameter of the circle of contact of the sphere and cone subtends an angle of 120° at the centre of the sphere; prove that the volume of the portion of the cone between the surface of the sphere and the vertex of the cone is one-eighth of the volume of the sphere. —*Ibid.*

21. Explain how the inclination of two planes to one another and of a line to plane are measured. Through a line AB are drawn two planes inclined to one another at an angle A . Through any point of AB a straight line is drawn in one of the planes making an angle B with AB . Prove that the straight line is inclined to the other plane at an angle $\sin(\sin A \sin B)$. —*Ibid.*

UNIVERSITY QUESTIONS.

LONDON UNIVERSITY MATRICULATION EXAMINATION PAPERS,
SEPTEMBER, 1911.

ENGLISH.

SUBJECTS FOR ESSAY.

Choose *one* of the following subjects :—

1. The Influence of Failure and Success upon Character.
2. The English Ideal of a King.
3. A Holiday on the Continent.
4. Careers for Girls.
5. The Races of the British Empire.
6. The Romance of Astronomy.
7. Social Life in the Reign of Queen Anne.

8. A Dialogue between two visitors from the Colonies on the subject of the Coronation Ceremony.

1. PRECIS.

Express clearly the substance of the following passage in about a fourth of its present length —

Then came the clash and confusion of the parties into which the once predominant old Whig party had been lately rent asunder. The difficulties of the situation were aggravated by the present strange and sullen seclusion of [the elder] Pitt. In vain he was appealed to; in vain the King made piteous submission to induce him to return to power; for while, on the one hand, a new administration seemed impossible without his help, on the other, it was plain that the Grenville ministry was tottering to its final fall.

Burke, not unreasonably, expected to obtain employment in the scramble. His friends were not ignorant that he had attached himself to that party among the Whigs which was the most pure and least powerful in the State. Lord Rockingham was at their head: a young nobleman of princely fortune and fascinating manners, who made up for powers of oratory, in which he was wholly deficient, by an inestimable art of attracting and securing friends, whose character was unstained by any of the intrigues of the past ten years, and who had selected for his associates men like himself, less noted for their brilliant talents than for their excellent sense and spotless honour. With the extremest opinions of Lord Temple these men had little in common. They had obtained the general repute of a kind of middle constitutional party. Little compatible was this with present popularity, as Burke well knew, but he saw beyond the present. To the last he hoped that Pitt might be moved; but though believing that without the splendid talents and boundless popularity of the great commoner, "an admirable and lasting system" could not then be formed, he also believed that the only substitute for Pitt's genius was Rockingham's sense and good faith, and that on this plain foundation

could be gradually raised a party which might revive Whig purity and honour, and last when Pitt should be no more. . . . Seven days after the administration was formed, Burke was appointed private secretary to the Marquis of Rockingham, and his great political life began.

2. FIGURATIVE EXPRESSIONS—GRAMMAR.

(a) Explain the following expressions and frame six sentences in each of which one is used : a sop for Cerberus—to cross the Rubicon—to take the lion's share—Draconian legislation—Arcadian simplicity—a Job's comforter.

(b) Construct five sentences, each illustrating one of the following kinds of dependent clause :—cause, purpose, concession, comparison, and condition.

3. PARAPHRASE.

Reproduce the substance of the following passage in the form and style appropriate to a prose narrative :—

In full blown dignity, see Wolsey stand,
Law in his voice and fortune in his hand ;
To him the church, the realm, their powers consign,
Thro' him the rays of regal bounty shine,
Turn'd by his nod the stream of honour flows,
His smile alone security bestows ;
Still to new heights his restless wishes tower,
Claim leads to claim and power advances power ;
Till conquest unresisted ceased to please,
And rights submitted left him none to seize.
At length his sovereign frowns—the train of state
Mark the keen glance, and watch the sign to hate.
Where'er he turns, he meets a stranger's eye,
His suppliants scorn him, and his followers fly . . .
With age, with cares, with maladies oppressed,
He seeks the refuge of monastic rest ;
Grief aids disease, remembered folly stings,
And his last sighs reproach the faith of kings.

4. SHAKESPEARE.

(a) Write explanatory notes on any *five* of the following passages from Prof. Raleigh's Shakespeare :—

- (i) His bad kings, Richard the Third and John , are not wholly unlike the villains of melodrama.
- (ii) In the *Midsummer Night's Dream* the inexplicable whims and changes of inconstant love seem to be the work of the fairies, sporting, not malevolently, with human weakness.
- (iii) Antonio and Bassanio are pale shadows of men compared with this gaunt tragic figure, whose love of his race is as deep as life.
- (iv) He stands among the crowd at the Coronation ceremony, by the side of Justice Shallow, whom he has cheated of money duped with promises of Royal favour, and despised ; he listens to the severe judgment of the King, and when it is ended, watches the retreating procession.
- (v) Shakespeare plainly admires Henry V., and feels towards him none of that resentment which the

spectacle of robust energy and easy success produces in weaker tempers.

- (vi) Coriolanus had to choose between the pride of his country and the closest of human affections.

- (vii) Why, it is often asked, did not Cordelia humour her father a little ?

- (viii) It has often been said that Shakespeare dislikes and distrusts crowds.

- (ix) In the plays of Shakespeare's closing years there is a pervading sense of quiet and happiness which seems to bear witness to a change in the mind of their author.

(b) Describe, with quotations, *one* of the characters referred to above.

5. ENGLISH POETRY.

(a) Mention instances from English literature of (i) the tale in verse ; (ii) the ode ; (iii) the reflective poem ; (iv) the poem describing rural life.

(b) Describe in detail *one* poem in your list.

6. HISTORIC NOVELS.

(a) Name historic novels by Scott, Thackeray, and Kingsley, and indicate the periods they describe.

(b) Write an account of some striking scene or adventure in *one* of these books.

CORRESPONDENCE.

ON THE TEACHING OF STATICS AND DYNAMICS.

To

The Editor of "THE COLLEGIAN."

DEAR SIR,

I shall be thankful if you kindly insert the following in your journal.

Under the new Regulations of the Calcutta University, Statics and Dynamics form part of the Mathematical syllabus prescribed for the students going up for the Intermediate Examination. Out of 200 marks in Mathematics, 100 marks are allotted to these two books alone. These two books are generally taken up in the second year class which is held barely for 5 months. The task of finishing two books like Statics and Dynamics within so short a period is a gigantic one. The question then naturally arises as to how to perform this task in the best manner within this period. In this letter I shall draw the attention of all concerned to one point only.

I may state here that the word "force" and its measurement, as they occur in Statics, are taken from Newton's first and second laws of motion. Moreover whenever we use the word "reaction" in Statics, we have to assume Newton's Third Law of Motion. Hence Statics is mainly founded upon the Laws of motion. The Student of Statics has to thoroughly understand the meanings of force, its measurement, action and reaction of two bodies upon each other. If he wishes to understand these definitions, he must first understand the laws of Motion. The assumption of the laws of motion in Statics without going through them is simply to put the cart before the horse.

If the professor first takes up Dynamics and then after finishing the laws of Motion, takes up Statics, explaining to the Students the parallelogram of forces as a consequence of the Second law of Motion, he will find that much time and labour have been saved. The students also will be better equipped for Statics. Experience has shown that if this method is followed, the rest of the work becomes simple and interesting.

As it is, Statics and Dynamics are generally taught in most of the colleges by two different professors. The best course in this case would be to divide the whole Mathematical class into two Sections and to place one section entirely in charge of one professor.

HEM CHANDRA SEN GUPTA,

*Professor of Mathematics, Presidency
College, Calcutta.*

REVIEWS.

Principles of Education. By W. Franklin Jones, Ph. D. (London : Macmillan and Co.) Price 4s. 6d. net.

Dr. Jones has adopted the Aristotelian practice of an exhaustive review of the available material before proceeding to generalise. The text is divided into seven chapters. The first deals with the meaning of education ; the second treats of the subjects of Study partly by way of values and partly by way of methods of application of life ; the third is entitled "Motivation" ; the fourth "Utilization of the Play Impulse" ; Chapter V deals with the subject "education carried on by direct personal influence of the teacher." In

the sixth chapter the author takes up "the methods" (particular and general).

First Book of English Literature. By H. S. Pancoast and P. V. D. Shelly (London : Geo. Bell and sons). Price 5s. net.

A good little volume which would be of immense service to the beginner in the History of English Literature. The development of the English literature from the songs of old Saxon minstrel down to the ballads of Rudyard Kipling is traced and the influences which have shaped its character and produced the man for the time are clearly noticed. The book is illustrated.

A Study of Indian Economics. By Pramatha Nath Banerjea M. A. (Macmillan and Co.) Price 3s. 6d. net.

The book though an elementary one would certainly be of very great use to students in Indian Economics for the B. A. Examination.

Shakespeare's Coriolanus. By A. W. Verity. (Cambridge University Press) 1s. 6d.

This abridged edition of Mr. Verity's Coriolanus would be highly useful to our college students like all other of Mr. Verity's Shakespeare Annotations.

The Origin of Tragedy. By W. Ridgeway. (Cambridge University Press). Price 6s. 6d. net.

The author traces the origin and history of Tragedy. The book is highly interesting.

An Elementary Treatise on Curve Tracing. By P. Frost, M. A. (London : Macmillan and Co.) Price 10s.

This is a reprint of Dr. Frost's book which was out of print for some years. Certainly it will be welcomed by our Mathematical students.

Elementary Trigonometry. By W. E. Paterson, M. A., B. Sc. (Oxford : Clarendon Press).

The author has not always followed the beaten track. He makes many new departures and that always successfully, for example, in defining the trigonometrical ratios, the

author has tried to remove the mistaken idea that the ratios are fundamentally attached to a triangle for the definitions are generally arrived at from a right-angled triangle. The examples are especially selected and the five-figure tables are intended to give results correct to four places.

A. School Geometry. By H. H. Champion, M. A. and the Rev. J. A. C. Lane M. A. (London: Rivingtons). Price 3s. 6d.

A neat handy volume which can be safely placed in the hands of the beginner. The book is divided into four parts: I. Line, Triangle and Parallelograms; II. Areas; III. Circle; IV. Ratio. Exceedingly valuable "parers" follow each part and at the end are twenty-four pages of Miscellaneous Papers. The paper, type, binding are all excellent.

SCIENCE NOTES

AND

OTHER INTERESTING MATTERS

WATER POWER VERSUS COAL.

In connection with Sir William Ramsay's address on the exhaustion of our coal supply an article in "*Cassier's Magazine*" on "Great Water Power Sites," by Henry Hale, is of special interest. It is there indicated what has been already done in many parts of the world in utilising streams and rivers as a source of power, and also how much still remains to be developed in this direction. Thus it has been estimated by Prof. Unwin that the available water power of the United States amounts to 30,000,000-h. p. And it is believed that by a system of storage reservoirs this might be increased to 150,000,000. As regards economy, it is pointed out that the saving effected by using water power instead of coal amounts to about £ 2 a year for every horse-power.

An interesting example. If the falls of Niagara were fully utilised, it is reckoned that they would supply energy equal to 7,000,000 horse-power, while on the Upper Mississippi 2,000,000 such units of work should be available. An interesting example of the recent development of water power is given from Kashmir. There the Jhelum River has been made to generate electrical power to deepen

its own channel and so prevent the overflowing of 200,000 acres of land, which are thus rendered available for agriculture. The fact that no coal was available, and that the site was 200 miles from the nearest railway station, rendered the use of water power imperative in this case but a judicious development of the powers of our own streams might considerably prolong the duration of our coalfield.

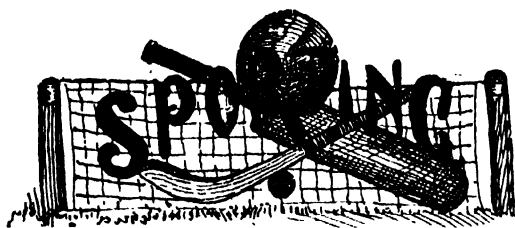
MEASUREMENT OF SMALL THICKNESS AND DISPLACEMENTS.

Mr. E. H. Rayner has recently described an ingenious arrangement for measuring small thickness and displacements with far greater sensitiveness than the micrometer will attain to. It consists of three conical feet, two in one plane and the other half-way between them, but slightly out of the plane, so that they rest in a hole, slot, and plane at the corners of a very obtuse angled triangle. The three feet are affixed at the upper end, to a lever carrying a concave mirror focussing a spot of light into a screen. Any slight shift of the third foot, the one that lies slightly out of the plane, causes a slight rotation of the lever, which is magnified considerably by the spot of light. The author has employed the apparatus to measure the expansion of short bars of quartz, only fifteen centimetres long; also uses are found for it in measuring thicknesses of mica, paper and foil; or, again, as an adjunct to a chemical balance, to obtain a first approximation to the weight. In the latter case the three legs of the tilting table are affixed to the end of three rods fitted at their other ends into a block of metal. The centre rod, on being bent by affixing a weight to it, will then tilt the table proportionally to the weight applied and the position of the weight on the rod.

LUMINESCENCE OF FIRE-FLIES.

Notwithstanding numerous investigations there seems to be still a great deal to be discovered to connection with the luminescence of fire-flies. F. A. Mc. Dermott and C. G. Crane have been recently studying some of the American Lampyrids. The find practically identically in the structure of the light producing organs in these beetles, which are popularly called fire-flies. The organ has two layers, an inner one, while and opaque, which

seems to serve as a reflector, and perhaps protects the insect from its own brightness, and an outer one, yellowish and translucent, which is the seat of the actual photogenic process. Physiological work led long ago to the conclusion that the photogenic process was of the nature of an oxidation, and this is corroborated by the study of the structure, *e. g.* by the demonstration of the innumerable tracheae which penetrate the organ.



DELHI CORONATION DURBAR TOURNAMENTS.

The following is the revised programme of polo, football, and hockey tournaments at the forthcoming Delhi Coronation Durbar :—

Monday, the 27th. November.—Polo, 1st round, 1st Match ; football, 1st round, 1st match ; football, 1st round, 2nd match.

Tuesday the 28th November.—Polo, 1st round, 2nd match ; hockey, 1st round, 1st match ; hockey, 1st round, 2nd match.

Wednesday the 29th November.—Polo 1st round, 3rd match ; football, 2nd round, 1st match ; football, 2nd round, 2nd match.

Thursday, the 30th November.—Polo, 1st round, 4th match ; hockey, 2nd round, 1st match ; hockey, 2nd round, 2nd match.

Friday, 1st December.—Polo, 1st round, 5th match ; football, 2nd round 4th match.

Saturday, 2nd December.—Polo, 1st round, 6th match ; hockey, 2nd round, 4th match.

Monday, the 4th December.—Polo, 2nd round 1st match ; football, semi-finals, (two matches.)

Tuesday, 5th December.—Polo, 2nd round, 2nd match ; hockey, semi-finals, (two matches.)

Wednesday 6th December.—Polo, 2nd round ; 3rd match.

Thursday 7th December.—Polo 2nd round ; 4th match.

Saturday, 9th December.—Polo, semi-finals; football, final.

Monday 11th December.—Polo, final.

Thursday, 14th December.—Hockey, final.

POONA DIVISIONAL HOCKEY TOURNAMENT.

The final game in the Poona Divisional Hockey Tournament for the Divisional Cup and to represent the Poona Division at Delhi was played on the 9th November between the 12th Pioneers, the winners of Poona section and the 103rd Mahrattas, the winners in Ahmed nagar Brigade. The game was followed with the keenest interest by the native troops in Poona. The 12th Pioneers won by four goals to the 103rd Maharatta's one goal. Major-General Alderson presented the Divisional Cup to the winners who now go to Delhi.

DELHI DURBAR HOCKEY TOURNAMENT. TIES.

First round—6th Poona Division vs. 5th Mhow Division, (A) 3rd Lahore Division vs. Burma Division. The following are the byes —1st Peshawar Division, 2nd Rawalpindi Division, 4th Quetta Division 7th Meerut Division, 8th Lucknow Division, 9th Secunderabad Division vs. 2nd Rawalpindi Division. (C) 1st Peshawar Division. vs. 7th Meerut Division (D) winners of (A) vs. 8th Lucknow Division (E) ; winners of (B) vs. 4th Quetta Division (F) Semi finals—winners of (C) vs. winners of (E),(G) winners of (D) vs. winners of (F) (H) ; Final—winners of (G) meet the winners of (H).

CRICKET.

Cricket is in full swing at Calcutta. Among the College teams special mention may be made of The St. Xavier's C. C., The Medical College C. C., The Presidency College C. C.

The St. Xavier's played with the Rangers C. C. in a full day match and were victorious by the big margin of 7 wickets.

Tha Medical College played a half day match with the Mohan Bagan Team. The game resulted in a draw in favour of the College team.

Among other games may be mentioned, Presidency College vs. Eden Hindu Hostel (E. H. H. win), Police F. C. vs. Ripon College (draw), Bengal Veterinary College vs. Jorabagan (Jorabagan win), Madrassa vs. Star A. C. (draw).

The most important game between other clubs during the fortnight was the match between The Sporting Union and the Aryans, played at the Marcus Square Grounds. The Aryans beat the Sporting Union by three wickets and five runs.

OTHER GAMES.

POLO. The following have entered up to the 7th of November for the Deihi Durbar Polo tournament. Entries close on the 20th November:—19th Hussars, Inniskilling Dragoons, 17th Lancers, 13th Hussars, King's Dragoon Guards, 17th Cavalry, 9th Hudson's Horse, the Palampur Team, Captain Barret's Scouts, Count Jean De Madres Tigers, Imperial Cadet Corps and Kishengarh, Golconda and Bhopal teams.

CUTTINGS

FROM

LEADING JOURNALS

THE MISSION OF SCIENCE.

THE eighty-first Annual Meeting of the British Association was held at Portsmouth under the presidency of Professor Sir William Ramsay, who delivered his presidential address in the Town Hall on August 30th.

The most striking feature of the address was the strong faith of the President in the mission of Science as the dominant factor in the civilisation of the world. To the ordinary layman the domain of Science usually appears restricted to the physical side of our life—to the development of manufactures, engineering, medicine, and surgery. In the scientific world of to-day, however, any such restriction is strongly repudiated, and it is boldly claimed that scientific methods of thought can be and must be applied in all departments of human activity. "We must cultivate," said Sir William, "a belief in the application of trained intelligence to all forms of national activity"; and again, "Human progress is so identified with scientific thought, both in its conception and realisation, that it seems as if they were alternative terms in the history of civilisation."

Nor is this belief in the destiny of science a

more pious aspiration. It is expressing itself more and more in fiction. The avowed object of the British Guild of Science—a young but vigorous institution—is "to impress on our people and their Government the necessity of viewing problems affecting the race and the State from the standpoint of science." In this connection one recalls Huxley's dictum that the only object worth fighting for in the political arena is the application of scientific principles to questions of government. Another instance in point is the foundation of the modern science of Eugenics. Moreover, the British Association itself is leading the way in the invasion of new territory, as is sufficiently proved by the fact that there are now fully organised Sections of the Association devoted to Agriculture, Anthropology, Education, and Economics.

A considerable portion of the presidential address was devoted to an interesting historical sketch of scientific ideas on the nature of the chemical elements. Sir William showed how the belief that all forms of matter are ultimately reducible to one simple form has been commonly present in the minds of leading scientific investigators. In 1811 Davy wrote, "To enquire whether the elements be capable of being composed and decomposed is a grand object of true philosophy"; and Faraday stated that "to decompose the metals, to reform them, and to realise the once absurd notion of transformation—these are the problems now given to the chemist for solution."

The discovery of the remarkable properties of radium has entirely vindicated this belief. Radium is undoubtedly an element and is undoubtedly breaking up into constituents, some of which are elements of less atomic weight, such as helium and lead, and others are bodies very much smaller than atoms, known as electrons. It is now known also that certain other elements are slowly disintegrating in a similar way, and it is reasonable to suppose that the remaining elements are doing the same, though the rate of decomposition is so slow that it has not yet been detected.

From this question the President passed by a natural transition to a discussion on the store of energy available in Britain for engineering processes. One ton of radium while disintegrating would give out sufficient energy to do as much work as $1\frac{1}{2}$ million tons of coal, but the President does not expect our machinery ever to be driven by means of radium, for two reasons first, that the total output of radium for the whole world is not likely to exceed half an ounce per year, and second, that radium cannot be hurried, but works very slowly, taking some thousand of years in giving out its energy.

Meanwhile we are faced with the fact that the industrial life of Britain is at present entirely dependent upon our coal supply, and that so far as can

be calculated this is not likely to last us for two centuries longer. The British Science Guild has accordingly appointed a special Committee to investigate the matter and to consider whether any other adequate source of energy is available in Britain.

It is conceivable that coal might be replaced by wood or peat, or that our machinery could be driven by wind power, by water power, by the tides, by the Sun's heat, or by the internal heat of the Earth tapped by deep borings; but after full consideration the Committee report that none of these methods appears capable of the work demanded from it if our coal supply gives out; so that for the present the only advice which can be given is to economise our coal supply and to be prepared for the emigration of the greater part of our population when this is exhausted.

Immense economies could certainly be made, as is easily seen from the following figures. The ordinary steam engine consumes from 4 to 5 pounds of coal per hour for each horse-power, while the stream turbine consumes from $1\frac{1}{2}$ to 2 pounds and the gas engine from 1 to $1\frac{1}{4}$ pounds. Sir William Ramsay, however, does not expect that much economy will be effected without the intervention of Parliament; he says that in times of prosperity the manufacturers are too busy to replace their steam engines by gas engines, and in times of depression they have not the money to spare.

The President concluded his address by an appeal for the cultivation of pure science. When everything has been said in commendation of the technical applications of science it still remains true that it is the cultivation of science in pursuit of abstract knowledge which has rendered possible the immense advances of recent centuries, and which alone can guarantee a corresponding rate of progress in the future.

The University Correspondent.

THE DULL BOY.

SCHOOL MASTERS are often twitted with the success in after life of boys who, at school, were labelled dull. Senior Wranglers have been known to lack mental alertness, outside the sphere of mathematics, and to be at a loss in dealing with the practical problems of life. These two phenomena merely mean that written examinations are not perfect instruments, and do not invariably give correct results as a standard of value. It was perhaps a little unkind of Mr. F. E. Kitchener, himself an old schoolmaster, to give Lord Kitchener away by telling his audience that his soldier cousin had managed to scramble

into Woolwich somehow, but that he was not high on the lists, and that nobody thought anything of him. Schoolmasters are a humble race, and are not in want of further lessons in humility. Yet it is not a bad thing to be reminded from time to time that the examination results, upon which parents insist as a criterion of the success of a school, are not always a safe guide. It is only indirectly that examinations can estimate moral qualities. Perseverance, industry, determination, and concentration help to examination successes; but it may happen that a candidate without these virtues heads the list, while the list, while the boy who has been a tower of strength as head of the house, and who has shown qualities that fit him for high command, may come out at the bottom.—*Journal of Education.*

BERNARD SHAW ON EDUCATION.

Mr. J. C. Millington in the *Journal of Education* describes a recent address to teachers by Mr. G. B. Shaw. "The lecturer opened with a jibe. Although he understood his audience consist largely of teachers, yet he proposed to address them as human beings—being able to note and learn from the ideas and feelings of the folk around them; and among these folk, in the first place, the children. So Mr. Shaw proceeded to describe and criticise schools from the patients' point of view. Seen thus, schools are prisons in which innocent and eager victims are cribbed and cabined for so many hours a day, just in order to keep them away from their homes, where they would otherwise be badgering their parents by asking questions that no one can answer.

"The punishment or torture chiefly used in the schools is the exacting of answers to questions based on school book. A school book one in which some subject of great interest is turned into an instrument of interrogative torture, and which, therefore no person would read if he were not forced to. . . . The boys and girls who have Shakespeare forced upon them as a school text become the men and women who never go to any other play than a musical comedy and who never dream of opening a book that has the world 'Shakespeare' on the back".

The Collegian.

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THE COLLEGIAN

An All-India Journal of Education.

NUMBER TWO, NOVEMBER.

Mr. Percy Brown, Principal of the Government School of Art, Calcutta has been commissioned to design the ornamentation of the address which will be presented by the Calcutta University to their Imperial Majesties on the occasion of their visit to Calcutta. The draft design which was under the consideration of the University authorities has been approved and the final order has just been communicated to Mr. Brown. The design will be in the Persian style. The upper portion will be a section of running borders, scrolls and Persian ornaments. On each side will be pear-shaped panels alternating with medallions, and it will be also filled with scrolls and volutes in correct oriental style. In the centre will be the address engrossed in letters of gold. The whole design is very artistic. The Indian and Persian styles have been purposely blended together. The object is to represent both Hindu and Mahomedan ideals.

The address delivered by the Honourable Mr. V. Krishnaswamy Iyer at the Convocation of the University of Madras held on Thursday the 23rd November 1911 is characterised by its reverence for the past of India. Still he is in thorough sympathy with the new ideals of progress drawn from the literature, thought and life of the West. Referring to the subject of the choice of a profession and the employment of our youngmen, Mr. Krishna-

swamy Iyer said, "There is a growing variety of occupation at the present day whether in official or business life though the number of eager applicants jostling one another for the hand of Fortune is ever on the increase. It rarely happens that the adaptation of talent to vocation fails to achieve success in life. I have sometimes asked myself whether the time has not come for the creation of an Employment Office similar to the one attached to the Harvard University, whose business it is to procure suitable position for under-graduates and all past members of the University seeking employment of any sort and to recommend the best available Harvard candidate for vacant positions made known to the Secretary." We fully endorse Mr. Krishnaswamy Iyer's suggestion.

At a meeting of the U. P. Legislative Council a resolution urging the inclusion of the Ayurvedic and Unani systems of medicine in the curriculum of studies of the Lucknow Medical College was lost. His Honour Mr. Leslie Porter said that the Government could not accept the resolution. The College had already been affiliated to the University of Allahabad and could not admit persons versed in Vaidic and Unani systems in the College for learning anatomy and surgery without violating the conditions of the University. Under the present rules only those candidates who had passed the Intermediate examination with some science subjects could be admitted to the College. He would not say that there was nothing to learn in Ayurvedic and Unani systems of medicine for those who had learnt under western methods, but in the cause of efficiency it was not proper to teach two inconsistent systems.

* * *

Sir Currimbhoy Ebrahim, the well-known Khoja merchant and philanthropist of Bombay, who was created a Baronet in June 1910 has made donations chiefly for charitable and educational purposes which come up to the magnificent total of Rs. 9,45,000. Sir Currimbhoy has benefited so many good causes and his name looms so large before the public eye at

Royal Visit
Calcutta
University's
Address

Lucknow
Medical
College

Madras
University
Convocation

Sir Currimbhoy
Ebrahim's
Benefactions

the present moment; that it would be interesting to detail below some of his principal donations. It was only the other day that he gave away Rs. 4,50,000 towards the establishment of the Institute of Science at Bombay. He gave the princely sum of Rs. 3,00,000 in 1905 for "a museum, a library and an art gallery, surrounded by public gardens which would at once be an ornament to the city and a centre of educative influence" to be named the Prince of Wales Museum. Besides this he gave Rs. 30,000 for a rest House in Cutch, Rs. 1,00,000 for the Khoja Orphanage at Bombay, Rs. 25,000 for a Girl's school at Mandvi which is open to all irrespective of caste and creed, Rs. 20,000 for the proposed Mahomedan University at Aligarh, Rs. 5,000 to found a scholarship for the benefit of Muhamedan boys, and Rs. 1,00,000 towards a scheme initiated by his son for a school for the Mahomedans of Western India.

* * *

Under the auspices of this literary association on the evening of the 23rd November Prof. J.C.

Moslem
Institute
Calcutta

Coyajee of the Presidency College gave an interesting discourse on Persian literature. Dr. Denison Ross was in the

chair and there was a good attendance of members. The lecturer, in dealing with his subject referred to the great Persian poets Sadi, Firdousi, Hafiz and others. He observed that Persian poetry—epic, lyric, mystic and romantic—owed its origin to Firdousi and recited passages from the great poet's works. He however regretted that prose had made no advance in Persian literature. Mr. Yusuf Ali, Barrister-at-Law made a few remarks elucidative of Firdousi's genius as a poet. With a brief speech from the chair, the proceedings terminated.

* * *

The report of the Director of Public Instruction Punjab, just issued, says,—Judged by the figures of the school attendance the year was one of considerable progress, the total increase being one of 12,901, pupils in public institutions and 4,573 pupils in private schools. The proportional increase was greatest in the High Schools and Arts Colleges. The increased attendance caused an increase in the total

Education
in the Punjab

income from fees, it having exceeded that of the previous year by no less than Rs. 1,88,707. Sir Louis Dane, therefore, draws an inference that the present scale of fees does not operate as a deterrent.

The use of the Nagri script as a medium of instruction is believed to be confined to the schools conducted by the Arya Samaj. The Director is convinced that there has been no slackening of effort on the part of officers of the department in championing educational interests. So far as the cessation of activity in opening primary schools is concerned the explanation is quite simple. A special recurring grant made by the Government of India in 1905 is now fully utilised in maintaining existing schools and the cost of any further increase has to be met from the limited resources of the Boards which are also drawn upon to provide higher pay for teachers, until another large grant is made from Imperial or Provincial funds. The Director hears there will be little appreciable addition to the number of Board Primary Schools. The Director thinks that stimulus will be given to educational work by a scheme for systematically proportioning Government grants to local expenditure on education.

* * *

At the South Behar Co-operative Credit Societies Conference held on the 11th of November, Mr.

South Behar
Co-operative
Conference

Syed Hasan Imam in his Presidential Address dealt with the subject of the

Co-operative Movement in a very able manner. Speaking of the usefulness of the Co-operative credit societies the speaker said, "Co-operative credit societies, by timely advances to the agriculturer and the artisan, are sure to exercise the influence that financing commands in all social grades, and if the societies are governed and controlled by honest, zealous and good men they will prove the potentiality of co-operation for good beyond our dreams. The advent of these societies will mean the disappearance of the usury of the village money lender and in their wake will come the prosperity to the agriculturer and the artisan that they do not possess now but which they are entitled to. I do not run down the

village *Bania* for he has had his usefulness so far in the absence of a better system. I do not shut my eyes to the *Banias'* justification for usurious rates, for where there is slender security a loan becomes a speculation and what he stands to lose by one debtor he tries to make out of another. With many bad debt if the *Bania's* accounts are examined he is not such a gainer as we give him credit for. The *Bania* by himself cannot inculcate in the people the merit of thrift, but a combination of the best men of the village will not merely exercise a moral force by reason of their numbers but will also restrain extravagance of every kind by power born of financial control."

An Innovation H. H. the Maharajah Scindia has drawn up an elaborate scheme of instruction by cinematograph for children in his State.

* * *

We regret to announce the death of Rao Bahadur Louis Christian Williams Pillay, late of the Madras Educational Service, which took place at his residence at Vadduk-koddai, Jaffna, Ceylon, on Sunday, the 19th November.

Mr. Williams Pillay came from a very respectable Christian family in Jaffna. Mr. L. C. Williams was a brilliant student, and immediately after passing the B. A. examination in 1874 of the Madras University, he entered Government Service in the Educational Department as an Assistant Master in the Presidency College, under Mr. E. Thompson. He soon made this mark in the Department, rising eventually to the highest post in the Service to which an Indian can aspire and held for several years before retirement the post of Inspector of Schools. He retired in January, 1910. He was in every way a distinguished product of the Madras University (of which he was also an Ordinary Fellow) not only as a brilliant and all-round scholar and a man of culture, but also as a versatile writer and an eloquent speaker. And as a servant of the State he was a trusted and approved officer.

* * *

The Managing Committee of the Students Brotherhood, Girgaum, Bombay are offering a prize known as the Mottwalla Prize of the value of Rs. 125, for the best essay in "The Theory and Practice of Social Service in India" to all undergraduates and graduates of not more than five years' standing. They have postponed the last date for the receipt of essays from 30th November to 31st January.

At a meeting of Teachers held at Colombo on the 4th Inst., the proposal for organizing a Teachers' Mutual Provident Fund was carried out, and the Ceylon Teachers' Union was revived and the Committee entrusted with the duty of formulating a scheme.

The thirty-fourth annual meeting of the Indian Association for the Cultivation of Science came off on Thursday evening the 23rd Novr. in the Association Hall (Bowbazar). Rai Calica Das Dutt Bahadur, ex-Dewan to the estate of the late Maharaja of Cooch Behar presiding. There was a fair gathering which included among others, Sir Goorudas Banerjee, Rai Dr. Chuni Lal Bose Bahadur, Mr. B. L. Chaudhuri, Mr. J. Ghosal and Dr. Amrita Lal Sircar. The agenda included several formal items of business. The report of the committee of management for the last year presented by the Secretary showed satisfactory progress of the Association, in all its branches. The financial position was sound. Prizes and medals were distributed to the successful students who has qualified themselves in Physics and Chemistry in both theoretical and practical tests. The Chairman made a few observations regarding the useful work done by the Association in the cause of scientific education and addressed a few words of encouragement to the prize winners. The proceedings closed with a vote of thanks to the chair.

Death of a
Madras
Educationist

Calcutta
Science
Associat



CALCUTTA UNIVERSITY.

The Government of Eastern Bengal and Assam has granted a special scholarship of Rs. 25/- a month for one year from 1st May 1911 to Miss Mrinalini Bose B. A. in order to enable her to prosecute a course of studies for the B. T. Examination.

MADRAS UNIVERSITY.

The Honourable Rao Bahadur Venktaswami Ramabhadra Nayudu Garu, Zemindar of Doddappanayakanur is appointed an ordinary fellow of the Madras University.

The following order of the Madras Government has been issued in order to encourage women desirous of entering the medical profession to obtain the degree of M. B. and C. M. of Madras University. The Governor in Council has resolved to award annually three stipends each of Rs. 25 a month to young women who undertake to study for that degree. The stipends will be allotted each year by the Provincial Committee of the Countess of Dufferin's fund and may be awarded either to students who have already passed the Intermediate Examination in Arts or to those who are reading for it. The maximum period of tenure of a student will be seven years, and the Committee may attach to it such conditions as they think fit. His Excellency in Council is of opinion that as a further inducement to obtain this higher qualification, enhanced salaries should be given to those

passing it. To enable the Committee to meet the expenditure on stipends and to assist by grants-in-aid those local bodies which are unable to defray the cost of giving enhanced salaries to medical women possessing higher qualifications than those now employed the Governor in Council directs that a grant of Rs. 12,000 per annum be made to the Provincial Committee of the Countess of Dufferin's Fund, with effect from 1st April, 1912.

The Hon. Mr. V. Krishnaswami Iyer in the course of his address at the Convocation of the Madras University announced his intention of endowing, in connection with the university a lectureship of the annual value of Rs. 250 in the honoured name of Sir S. Subramania Iyer, the only Indian on whom the University has conferred the degree of Doctor of Laws for eminent services to the country.

BOMBAY UNIVERSITY.

It is notified that the next award of the Sir Mangaldas Nathubhai Law scholarship will be made on the results of the 2nd LL. B. Examination to be held in June last and the examination held during this month. Candidates should send in their applications to the Registrar under Form 119 (vide page 909 of calendar 1911-12) so as to reach him not later than 5th January 1912. For regulations vide page 583 of Calendar 1911-12.

M. D. EXAMINATION :—Branch I (Medicine) :

Mr. N. F. Surveyor and Major Hutchinson. FINAL M.B., B.S. (Part II.)—Surgery : Lt. Col Street and Dr. H. N. Ankselaria. Midwifery ; Lt. Col. Collie and Dr. Nariniar. Ophthalmology ; Major Mc. Pherson.

L.M.S.—Medicine and Pathology : Lt. Col. Child and Major Tucker. Surgery : Lt. Col. Street and Dr. H. N. Ankselaria. Midwifery and Diseases of Women : Lt. Col. Collie and Dr. Nariniar. Medical Juresprudence, Hygeine &c. : Dr. B. G. Ghasvalla and Major L.T.R. Hutchinson.

FINAL M.B., B.S. (Part I.)—Medicine and Therapeutics : Lt. Col. Child and Major Tucker. Medical Juresprudence and Mental diseases : Major Dickinson and Major Gordon Tucker. General Pathology and Bacteriology : R. Row Esq. M.D., D. Sc. and Major Tucker Hygeine : Major Hutchinson.

PUNJAB UNIVERSITY.

Date of Convocation The annual Convocation of the Punjab University will be held in the University Hall, Lahore, on Friday, December 22nd.

The Senate of the Punjab University has sanctioned a donation of three thousand rupees in response to the appeal by Professor Macdonald, of Oxford, for a critical edition of the "Mahabharata" undertaken by the International Convention of Academies.

A grant A. C. Woolner, Esquire, M. A., Registrar, Panjab University and Principal, Oriental College, is granted leave out of India for 10 months from 1st. December, 1911.

Registrar's Leave P. N. Dutt, Esquire, B.A., R.S., Assistant Registrar, is appointed to officiate as Registrar of the Punjab University with effect from the 1st. December, 1911.

Dr. Prabhu Datta is appointed to officiate as Principal of the Oriental College with effect from 1st. December, 1911.

The following Colleges were recommended by the Syndicate for an extension of affiliation in the subjects noted against each.—

Extension of affiliation D. A.-V College, Lahore—B. Sc. Mathematics and Chemistry from the

1913 Exam.

Randhir College, Kapurthala—Intermediate Philosophy.

Government College, Lahore.—M.A. and B.A. History and Economics.

Islamia College, Lahore—B.A. History and Economics.

The Syndicate approved of the appointment of Lala Tara Chand Roy to the McLeod Kashmir Sanskrit Studentship and of M. Muhammad Afzal Husain to the Alfred Patiala Studentship, which had been made provisionally under the sanction of the Vice-Chancellor in the absence of other candidates.

The following sub-committee was appointed to frame recommendations for the distribution of the Grant of Rs. 20,000 from the Government of India in aid of collegiate Education. The Director of Public Instruction, Panjab, Hon'ble Mr. Justice Mohammad Shah Din, S. Robson Esq., Hon'ble Mr. Shadi Lal and the Registrar.

Committee for distribution of grants to Colleges

ALLAHABAD UNIVERSITY.

Fellow Reverend Dr. A. Robertson, Principal Hislop College, Nagpur, has been appointed an ordinary fellow of the Allahabad University from 10th November 1911.

The annual Convocation of the Allahabad University was held in the Vizianagram Hall of the Muir Central College on Saturday the 11th November, 1911, His Honour the Lieutenant Governor Mr. Leslie Porter, the Chancellor, presiding.

THE HONORARY DEGREES.

The Vice-Chancellor, having declared the Convocation opened, presented Sir George Knox to the Chancellor amid loud cheers for conferring the degree of Doctor of Laws. The necessary formality having been gone through, the Hon. Rai Bahadur Pandit Sundar Lal C. I. E. and Mr. A. Venis, M. A., were presented in turn for their respective honorary degrees of Doctor of Laws and Doctor of Letters. Both were received with cheers as they came up.

OTHER DEGREES.

Subsequently the Principal and Professors of various colleges presented to the Vice-Chancellor the students of their respective colleges who

attended to receive their degrees. The following are the numbers of candidates from the various colleges who qualified themselves in the examination of 1911 for degrees.

Master of Arts :—Agra College 6 ; Allahabad M. C. College 5 ; Benares C. H. College 1 ; Lucknow Canning College 2 ; Aligarh M. A. O. College 3 ; Allahabad Christian College 1 ; and teachers 5.

Bachelor of Arts :—Agra College 35 ; Agra St. John's College 29 ; Aligarh M. A. O. College 65 ; Allahabad M. C. College 31 ; Allahabad Christian College 34 ; Bareilly College 13 ; Benares Queen's College 7 ; Benares C. H. College 15 ; Cawnpore C. C. College 6 ; Lucknow Canning College 22 ; Lucknow R. C. College 5 ; Lucknow Isabella Thoburn College 3 ; Meerut College 11 ; Mussoore Woodstock College 1 ; Ajmer Government College 6 ; Jodhpur Jaswant College 2 ; Jaipur Maharaja's College 6 ; Gwalior Victoria College 6 ; Indore Holkar College 4 ; Indore Canadian Mission College 1 ; Jubbulpore Government College 8 ; Nagpur Hislop College 17 ; Nagpur Morris College 20 ; and teachers 17.

Master of Science :—Allahabad M. C. College 4.

Bachelor of Science :—Agra College 7 ; Agra St. John's College 1 ; Aligarh M. A. O. College 8 ; Allahabad M. C. College 38 ; Allahabad Christian College 5 ; Benares Queen's College 4 ; Benares C. H. College 8 ; Lucknow Canning College 4 ; Lucknow Reid Christian College 1 ; Meerut College 3 ; Jaipur Maharaja's College 4 ; Lashkar Victoria College 1 ; Indore Holkar College 4 ; Jubbulpore Government College 6 ; and Nagpur Hislop College and the Victoria College of Science, Nagpur, 4.

Bachelor of Laws :—Agra College 8 ; Agra St. John's College 2 ; Allahabad University Law College 54 ; Aligarh M. A. O. College 4 ; Lucknow Canning College 4 ; Meerut College 3 ; and Nagpur Morris College 23.

Licentiate of Teaching :—Higher Grade Training College, Allahabad 27.

The first candidate presented was Miss Promil Ghosh of the Isabella Thoburn College, Lucknow to receive the degree of the Bachelor of Arts. In

all there were 10 female candidates, 5 for receiving the degree of the Bachelor of Arts and 5 for the degree of the Licentiate of Teaching. Out of these ten only five were present. As batches after batches of candidates were presented to the Vice-Chancellor they were cheered from the galleries.

THE CHANCELLOR'S ADDRESS.

The Chancellor then rose amid loud cheers to address the Convocation. His Honour first referred to the new buildings that are being constructed for the University, which would consist of a Senate Hall, a Law College and a Library. The new Senate Hall is nearing completion. His Honour in reviewing the progress of education in the United Provinces said "The year has seen some notable extensions of University activity. The most important of these is the opening of the new Faculty of Medicine. You will doubtless remember that when their Imperial Majesties visited India a few years ago as Prince and Princess of Wales a sum of about 12 lakhs was subscribed by the public to found a medical college in commemoration of that auspicious event. Government in addition to giving a site supplemented the subscription by a grant of about 20 lakhs in order to complete the scheme by providing a hospital in connection with the college, hostels for the students, residences for the staff and supplying the numerous other requirements of a high-class Medical institution. The college has not yet been formally opened, but it has commenced working : and it is, I think, a good omen that the completion of the college should coincide with the second visit of their Imperial Majesties to this country. The college claims, and I think with justice, that it is one of the most up-to-date and best-equipped institutions in the East."

His Honour noticed that the University has also recognised commerce as a subject for university extension. The Chancellor also referred to Cawnpore and the Technological Institute at that place. In conclusion Mr. Porter made reference to the two denominational universities, it is proposed to establish in the United Provinces, his only reason for doing so, he said, being that an eloquent advocate of one of the schemes had put forward the

argument that another university was needed because the standard of the Allahabad University was too high and a number of bright young lives were being sacrificed because they could not obtain a university degree. That argument, said His Honour, was based on an entire misapprehension of the functions of a university, and, he significantly added, "it had always been the aim of the Allahabad University to maintain a high standard. If other universities with other aims come into existence, the duty of the Allahabad University is clear. It must hold by its traditions, and I have no doubt the Allahabad University will acquit itself of that duty as worthily in the future as it has in the past".

At the Annual Meeting, on the motion of Hon.

Col. C. C. Manifold seconded by the

Annual Senate
Meeting 10th
November 1911

Hon. Pandit Sunder Lal, Major W. Selby was elected to represent the

Faculty of Medicine on the Syndicate.

The Registrar then reported the recommendation of the Syndicate that the Rev. A. Crosthwaite be appointed a member of the Board of Inspectors for Arts and Science Colleges, and that the Hon. Sir George Knox and the Hon. Pandit Sunder Lal be appointed members of the Board of Inspectors for Law College and it was confirmed.

The Registrar then placed before the meeting the recommendations of the Syndicate as to the affiliation of several colleges in different subjects and they were confirmed.

The assignments of the new Follows, Major W. Selby, Mr. R. McGavin Spence, Mr. H. M. Bull and the Rev. Dr. Robertson to different faculties made by the Vice-Chancellor were confirmed.

Dr. Ganganath Jha then moved that a candidate should complete his eighteenth year before he sat for the Intermediate examination, the twentieth year before he sat for the B. A. Examination. He said that that was necessary in order strictly to enforce their rule of 16 years as to the Matriculation examination. It was to prevent

students from other universities who had not the age-limit of 16 from having an advantage over their students even after joining the Allahabad University. Sir George Knox seconded the motion and it was carried.

On the motion of the Hon. Col. Manifold the regulations necessitated by the establishment of the Medical College at Lucknow were adopted by the meeting.



AND SCHOOLS.

Prof. V. H. Jackson is coming to the Presidency College as Professor of Physics from the Purna College. Babu Dwijendra Kumar Majumdar, B. A., first Assistant in the Physical Laboratory, is appointed sub *pro tem* Demonstrator of Physics and placed in class VIII (s. p. t.) in the Provincial Education Service.

We hear that the Hare School is to be removed to Bhowanipore and the new buildings are to be built in the land where at present a bustee stands occupying the first 100 yards of Russa Road on the west side opposite the London Missionary Institution. Seven and a half bighas of land are being acquired there "for a public purpose, namely, changing a school which is opposite another school to a new and more convenient site."

Hare School
Calcutta

Mr. L. Curtis Guise, a recent graduate of the University of Michigan, U. S. A., has been appointed to the staff and is expected to join duty before the end

American
College
Madura

of this year.

A recent cablegram received from America announces a donation of 30,000 dollars for a new science laboratory and equipment and a new bungalow for the college. This will enable the college authorities to take a long step in advance in college matters.

In accordance with the proposal of the Director of Public Instruction, Travancore, it has been sanctioned by His Highness the Maharajah's Government that a new Combined hostel should be built for the three colleges in Trivandrum viz. the Arts College, Law College and the Training College. The site selected for the Hostel is none other than the extensive Maidan lying to the east of the Government Public Offices. Being the centre of the town and for the same reason the centre of the three above mentioned colleges, it will no doubt afford ample convenience to the students of these colleges, who, when the proposed Hostel is completed, will spare no time in bestowing their sincere and heartfelt thanks to the munificence and large heartedness of his Highness the Maharaja and the disinterestedness of the Director of Public Instruction.

The Chief Engineer has been duly ordered to prepare plans and estimates for the construction of the grand building which he will no doubt slick off in the course of a few months. The long felt need of the law students and the training students for a proper hostel for them which was only a day dream some months back, has now become a reality. No more shall we see, the poor and helpless students who come here from Northern India and other parts for studying law, running here and there for comfortable accommodations and murmuring always for want of sweet dainty meal.

The present Caste Hindu Hostel which is now confined only to the Arts College students is indeed a great success and many thanks are due to Mr. L. C. Hodgson and Mr. N. LaBouchardiere M. A. (the present Warden) for the untold troubles they have taken in bringing up the Hostel to what it is at present.

Let us then wait and see the early completion

of the proposed hostel, which is nothing but an evolution of the present one, and which will no doubt be a great boon to the several students who come here year after year from foreign places, to prosecute their studies in the Arts College, Law College & Training College. (*Our Correspondent*)

The report for the month of October, reads—
At the request of the founders, Mr. Y. V.

Bhandarkar and Mr. Gole, High Court Pleaders, visited the school during the last month and have expressed their satisfaction of the work done by the school. In this month, the following

Young Men's
Educational
Society
Free Night
School
Bombay

gentlemen have contributed donations for the school:—Sheth S. R. Jilkar, Rs. 10; Sheth D. P. Banker, Rs. 5; Sheth S. S. Gangala, Rs. 5; "Ksha," Rs. 2; Mr. Y. A. Kunte, Rs. 1-8; and donations under rupee one, Rs. 5-12. Total Rs. 29-4. Half anna Fund collected on Bali Pratipada Holiday, Rs. 47-5-6; total Rs. 76-9-6; Last month's balance, Rs. 47-13-4; grand total Rs. 124-6-10. Expenditure for school during the month, Rs. 25-7-2; balance in hand, Rs. 98 15-8. The Half Anna Fund (Dhabu Fund) for the maintenance of the Free Night Schools of the Society, which was declared on the auspicious "Bali Pratipada" Holiday, was much appreciated by the public.

His Highness the Maharaja of Kashmir announced in his speech at the prize distribution of the State College and school that he was proposing to secure the service of Mr. Robson, Principal of the Government College Lahore who is going to retire from Government service, as Principal of the Prince of Wales' College Jammu. This would certainly be a valuable acquisition to the college.

Prince of
Wales'
College Jammu

Lady Dane performed the foundation-stone ceremony of Queen Mary's College before a distinguished and representative audience on the 16th November 1911. The proceedings began with a report read by Sir Pratul Chandra Chatterji, President of the Managing Committee, in which he gave a his-

Queen Mary's
College
Lahore

story of the School the proposal of which was put forward by certain Indian ladies who attended a purdah party given in Lahore in November, 1905, in honour of the Princess of Wales, now the Queen-Empress. The school was opened in December, 1908, in a rented bungalow under the charge of several European mistresses. The question of a permanent habitation presented difficulties. At last the Local Government gave six acres of Nazul land in Durand Road in the Civil Lines where the school will be built. Cash and property in the hands of the Committee stand at Rs. 90,000, and the Government of India's grant amounts to another Rs. 50,000. The buildings, for which Sardar Bahadur Ramsingh has made designs, will cost a lakh and a half. After Lady Dane laid the foundation stone Sir Louis Dane then addressed the gathering, speaking in Urdu. His Honour announced that the Maharani of Patiala had given a donation of Rs. 10,000; the Begum Sahib of Bhawalpur, Rs. 10,000; the Rani of Kalsia, Rs. 5,000; the Rani of Jhind Rs. 5,000; while the Rani of Faridkot promised to make up any deficit. There were minor donations. His Honour appealed to the public for another Rs. 60,000 to maintain the efficiency of the College. His Honour then explained that the name of the institution had been changed from the Victoria May Girls' High School to Queen Mary's College, as the presence of another institution named the Victoria Girls' School gave rise to confusion. His Honour then read a letter from Major Wigram, Private Secretary to the Queen-Empress, which runs thus;—"Her Majesty commands me to say that she will be pleased to allow the name of the Victoria May Girls' School at Lahore to be changed to Queen Mary's College. I am further commanded to say that the Queen sincerely sympathises with the objects for which the institution has been started and will take warm interest in its progress and welfare. Her Majesty wishes the ceremony of laying the foundation stone every success."

His Highness the Raja of Nabha has given a donation Rs. 6,000 to the College.

The social gathering of the past and present students of Christ Church College, Cawnpore, commenced on Friday the 17th November. The Lord Bishop of Lucknow, who is the late Principal of the College, and many past students arrived the previous night. The present students gave a very successful performance of the Merchant of Venice and Khubsurat Bala. Sports took place on Saturday. The Lord Bishop delivered his lecture on Sunday. Babu Anand Saroop, Vice-President, Bar Association opened the Westcott Memorial Library on the 20th instant; in a sweet little speech he referred to the many qualities of head and heart possessed by Canon Westcott, late Principal of the College, now Bishop of Lucknow, and to his numerous public activities in the province in general and Cawnpore in particular. Even the Principal and other European members of the college staff wore light blue *pugrees* and college uniform. This was the special feature of this gathering.

The opening ceremony of the Hewett High School of Rae Bareilly came off on Saturday, the 11th November. Its foundation stone, was laid by Sir John Prescott Hewett.

All the European officials and the *elite* of the city were present under a big *shamiana* which was specially erected for this occasion and was tastefully decorated. At 4-30 P. M. came the Hon. Mr. A. L. Saunders, Commissioner of Lucknow, who was received by Rana Sheo Raj Singh Saheb of Khajurgoan and conducted to his seat on the dais.

The Rana Saheb who has given Rs. 55,000 for this building thanked the Hon. Mr. Saunders for the trouble he had taken to come over to Rae Bareilly and requested him to formally open the School.

The Hon. Mr. Saunders thanked the Rana Saheb for his kind words and said that his Honour the Lieutenant-Governor would have been glad to perform this function himself but he could not do so owing to important engagements.

A speech was delivered by Pandit Nand Kishore Bani Bhushan and a poem in Hindustani was read

by Dr. Mahmoodul Hassan which was specially composed for the occasion. Mr. Saunders then declared the school formally open and saw the building which has in addition to many rooms got a very big hall, a science theatre and a well equipped room for a drawing class.

THE DYAL SING COLLEGE LAHORE.

(From Our Lahore Correspondent.)

Among the many sided activities in which the late lamented Sirdar Dyal Singh Majithia took interest, educational was one. For general dissemination of public opinion he set apart a considerable sum which has, after his sad demise, been utilised for the Library and Reading-room called after his name, and where ordinary newspapers, English and vernacular, various monthlies from England and America as well as local, are being laid on the tables for general perusal. Though the Library has not as yet been equipped with books, which is left to be done in a near future as the committee of management is now too full, the reading-room

can find no equal in the whole of the Province. The Dyal Singh School is another act which can be claimed to be through the late Sirdar's generosity. It has on its rolls about a thousand students and the figures in the results of the last Matric Examination show that it is one of the best institutions in Lahore. It has been proposed to remove the school from the building inside the city and consequently in a not healthy locality, to the edifice which is at present occupied by the college authorities.

In his Will and Testament, dated the 15th June 1895, Sirdar Dyal laid down as one of the conditions of the birth of a college, the following :

"It shall be the duty of the said Committee of Trustees to establish and maintain out of the funds and income of the property mentioned in para viii, here of a first class Arts College, with or without any school classes as to the said committee may appear desirable for the spread and dissemination of a sound liberal education in this Province, in which College every attempt shall be made to inculcate pure morality and the Principles



of Theism consistent with the tenets of the Brahmo religion by the personal example of the teaching staff, as far as possible, by instituting a course of lectures and such other similar means as may to the

said committee appear proper and feasible." As a result of this will a committee was formed with Mr. Harkeshen Lal, of the firm of Harkeshen Lal and Co. as Chairman, which made an active effort

to set up the desired Institution as soon as possible. The buildings left by Sirdar Dyal Singh are tentatively used for instruction purposes and for Boarding House. The College was opened by His Honor Sir Louis Dane K. C. S. I. Lieutenant Governor of the Punjab on the 3rd May 1910.

It was also distinctly put down that the college should be run in equal lines with other Government Colleges and should be affiliated to the Universities of the Panjab and Calcutta. While the former condition is traced out with every minuteness, the college Trust Committee thought it more desirable to affiliate the Institution with the Panjab University only and thus lead one symmetrical course of instruction. With the college are attached several good houses, all nice, trim and healthy, which are used as the Boarding Houses. Students are advised to live in Boarding Houses whereby they would get better "education" in contact with professors, several of whom live near it.

About the staff. The staff consists of men of high educational abilities and with teaching experiences. Principal N. G. Welinkar, M. A. L. L. B. has earned a lasting educational fame in Bombay and has already won the hearts of students with his erudition and sympathy. Professors Philip E. Richards M. A. (Oxon) and Vasudeva A. Sukhlankar Ph. D. have been two acquisitions to the College staff. The former with his wife has equally adjusted himself to the climate and surroundings of India. To speak of these gentlemen means in no way to depreciate the value of other Professors who are really working with a youth's zeal and an old man's experience. But space does not allow us to dilate separately on their respective merits.

About the students: There are at present three hundred and sixty students on the rolls. The classes which consist of Intermediate in Arts and in Science, and Bachelor of Arts are already full, and a sign of anxiety is perceptible in the faces of the staff as well as the Managing committee as to how to provide for the increasing number of boys which must come off, the next year without doubt. The building where the classes are held now a-days is primarily meant for the school purpose, and the Trust Committee is con-

templating of erecting the college buildings as early as possible.

The students are taught in—

Arts Faculty :—English, E Mathematics (Pure and Applied courses), History, Philosophy, Economics, Sanskrit and Persian—up to the B. A. Standard ; Physics and Chemistry up to the Intermediate Standard.

Science Faculty : Mathematics and Astronomy up to the B. Sc. Standard ; Biology (*i.e.* Botany and Zoology), Physics and Chemistry up to the I. Sc. Standard.

Honours Courses for the B. Sc and B. A. are also taught. As desired by the Testator, religious classes are also held everyday, where instruction in morality and the principles of religion according to Brahmo standard, is given. Every facility is given to the students for the improvement of their health, and a fine gymnasium adjoining the Boarding House is visited evening after evening by a number of resident as well as non resident student. Besides, there are a few Tennis courts. The Hockey Cricket and Football teams are open to any student who wishes to join either of them.

Fees for the Courses : Intermediate Classes have to pay Rs. 4-8 and B. A and B. Sc. Class Rs. 6 a month. An admission fee of Rs. 4 is also charged from those newly admitted, also a student taking up a Science subject e.g Chemistry or Biology has to pay a sum of Rs 5 to cover the expenses of any brerakage that may occur during his course of instuction.

The fees in the College are the lowest in the Province, and, hence an attraction to poor and deserving students, who in addition, enjoy the benefit of remittance of half their fees if the authorities consider it justifiable.

There are also scholarships in the College, and consideration is made about the monetary circumstances of the deserving candidates when these are allotted to them.

The Tutorial System : Another characteristic of the College, and of all the Panjab Colleges, in the Tutorial System. Every student when enrolled is made over to one professor or other who looks after his health, his education and any diffi-

culties that may come in his way. Such professor is placed in charge of a group of students with whom he will endeavour to cultivate friendly intercourse and will seek opportunities of promoting their moral, intellectual and national well-being.

The Library: The College also owns a Library which has yet made no great strides towards improvement, but is expected to be complete in a few months' time by the sum set apart for the purpose by the Trust added by a University grant. A number of newspapers and journals are subscribed already and are at the disposal of students.

In conclusion, all the credit is due to Prof. Ruchi Ram Sahni, M. A. of the Government College, through whose whole-hearted efforts as the Honorary Secretary of the Dyal Singh College Trust Committee, the entire success and uplift of this noble institution is due.



The Government of India have decided to place Lieutenant-Colonel E. H. de V. Atkinson, R. E., Principal, Thomason College, Roorkee, and Mr. T. Dawson, Principal, Victoria Technical Institute, Bombay, on special duty with effect from the commencement of the new year or thereabouts. The object of the special duty is to bring the technical institutions of India into closer practical relations with the employers of labour in the country whether they be Government workshops or factories or private concerns. Colonel Atkinson and Mr. Dawson will study the existing requirements of employers of labour and how far they can be met at the existing Institutions. They will also make proposals for establishing closer connec-

tion between existing business concerns and the existing technical institutions. On entering any province they will report themselves to the local Governments and conduct their enquiries on lines approved by the Local Governments and in the company of any person whom the Local Governments may appoint for the purpose. It is earnestly hoped that employers of labour will co-operate with the Government in this important practical work.

The seventh meeting of the Board of Agriculture was opened on the 21st November at Pusa.

There were about 70 members and visitors present. The programme was a lengthy one comprising thirteen subjects some of which are of considerable importance, the time of the Board was fully occupied for the next six days. The Hon'ble Mr. Carlyle, Member of Revenue and Agriculture and the Hon'ble Mr. W. H. Clark, Member of Commerce and Industry, attended on Friday the 24th when the discussion on sugar took place. Mr. Bernard Coventry, Officiating Inspector-General of Agriculture, presided and delivered a lengthy address. Mr. Coventry outlined the programme before the meeting and said that among the subjects that would engage its attention were the following:—(1) Best means of bringing the results of experimental work in agriculture to the notice of cultivators; (2) manures—the economical manures and the best means to use them and the conservation and application of cattle manure; (3) the question of granting honorary degrees of L. Ag. to diplomates of the old Agricultural Colleges who have done work of exceptional merit; (4) duties of agricultural associations in India; (5) the general lines on which the organisation of scientific research in the Provincial departments should be developed; (6) the maintenance of pure and impure varieties of crops; (7) the Indian sugar industry.

Agricultural
(conference)

Technical
Institutions
and Factories

At a meeting of the Council of the Indian Institute of Science held in the Institute premises on the 16th November the following members were present:—The Hon'ble Colonel Hugh Daly, Resident in Mysore, Mr. T. Annanda Rau, Dewan of Mysore, Mr. H. J. Bhabha, Mr. N. V. Gamadia (on behalf of the Tata family), the Hon'ble Mr. Chatterton, Director of Industries, Madras and the Director and Staff of the Institute. The business was of a purely formal character, being mainly to receive the directors' report. The question of opening the two remaining departments of applied science applicable to Indian arts and industries has now been taken into consideration.

During the term of the work covered by Dr. Morris Travers' report twenty-five students, twenty of whom are from Northern India, were in residence and have had most active time in the laboratories. All the students are graduates of Indian Universities who have been attracted to the post-graduate study, offered by the Institute, entirely without the inducement of scholarships. They are Brahmins (Bengalis), non-vegetarian Hindus and Europeans who are grouped in separate messes by which system they are enabled to use separate kitchens and servants' sleeping accommodation, and enjoy complete freedom as to dietary of which they are accustomed in the different provinces from which they are come. The machinery and apparatus of the department of applied chemistry under Professor Rudolf is now complete and Dr. Hay's department has the largest sized machinery illustrating almost every type of motor generator in use. The next term begins on the 1st. January when the students will reassemble who are now mostly leaving for the North in connection with the Royal Visit.

The United Provinces Government has decided to send annually a limited number of approved students for training to the Punjab and Bengal Veterinary Colleges as scholarship-holders in order that they may become veterinary graduates qualified to fill appoin-

ments, on the subordinate staff of the Civil Veterinary Department. The first batch of students will be sent in April next.

Carpentry
School,
Bareilly

The Secretary of State has appointed Mr. H. F. Kinns as Instructor for the Carpentry School at Bareilly.

THE CAWNPORE AGRICULTURAL COLLEGE.

The new building of the Agricultural College and laboratories which was formally opened by His Honour the Lieutenant Governor on the afternoon of the 18th November was designed by Mr. Wildeblood of the Public Works department and was constructed under the supervision of Lala Wazir Sahai, District Engineer, Cawnpore. It is one of the finest buildings recently erected by Government and is of Saracenic style of architecture. The building has throughout a facing of white Gwalior stone which together with the beautiful carving gives it a grand and majestic appearance. The whole building has cost about 4 Lakhs of rupees while the internal fittings are of the value of a lakh of rupees. The building represents a three sided quadrangle with the central block running exactly North and South with the two remaining blocks at right angles to it. The main or central block, which is the most beautiful part of the building, consists of three domes. The central dome which is surrounded by four cupolas is taken up by the College Museum and the office of the Principal of the College. On either side of the central dome are two smaller domes which have under them gallieried class rooms; the platforms for lecturers having above them beautiful arches in classic style. On the South of the central block is the block devoted to the teaching of Physics, Chemistry and Chemical research. In this section are situated the offices of the Agricultural Chemist, the lecture theatres, Physical, Chemical and Research laboratories, the fittings of which are most up-to-date and the laboratories are one of the finest in India. The other block on the North is taken up by the Botanical section; the photogra-

Veterinary
students from
the U. P.

phic studio here is worth seeing. Facing the College are two big lawns, and at a stone's throw from the building are the bungalows of the European staff of the College. To the south of the College are the Boarding Houses consisting of 52 rooms, a heading room, a hospital and a dispensary, dining hall for Hindus and Mahomedans and quarters for four Superintendents of the Boarding Houses, who are all Lecturers of the College.

Mr. W. H. Moreland, Director of Agriculture, while requesting his Honour to declare the buildings open, nicely traced the gradual development of agricultural research and education in the U. P. He said. "It is many years since Cawnpore became the headquarters of the work of the Agricultural Department, but in the early days there was no teaching of an organised kind nor was there any provision for laboratory research. The first step towards providing instruction in agriculture was taken as the result of the Committee on Technical Education which reported to Sir Auckland Colvin in the year 1891. That Committee recommended that an agricultural school should be established here to serve a three-fold object : to train teachers for agricultural classes : to give landholders and other persons interested in agriculture an opportunity of receiving instruction in the subject : and to introduce in the subordinate revenue service an amount of agricultural knowledge which should prove of direct practical utility. This recommendation was accepted by Government, and the agricultural school was opened here in the year 1893, with staff and equipment that to day seem ludicrously inadequate. A course of instruction was gradually worked out, and under the influence of the first Principal, the late Mr. Subbiah, whose premature death was a heavy loss to the province of his adoption, the students began to make their mark, both in the reeven service and on the agricultural staff which was gradually being brought into existence. Broadly speaking, it was a school for officials only : it was open indeed to agriculturists, but very few of these came forward, and those who did were usually seeking Government service of one kind or another.

"An even greater defect was the absence of any provision in connection with the school for laboratory research : so lately as twelve years ago there was not in the department a single officer with higher scientific training, and we had to rely on the assistance—always willingly given—of officers under the Government of India or serving in other departments or provinces.

"The need for further development was recognised by Sir Antony MacDonnell, and in a minute recorded by him in 1901, he called for a practical scheme for establishing an agricultural college. A scheme was accordingly prepared, but its consideration was deferred by the Government of India in view of the opening of the College at Pusa, and for the time being action was limited to improving the staff and equipment of the existing school.

"A new era, however, opened in 1905 with the announcement of the decision of Lord Curzon's Government to provide funds for the development of effective agricultural departments throughout India. The grant assigned to these provinces rendered it possible to undertake a scheme which will comprise a central institution for research and instruction as well as a local organisation to render assistance to the public. It is this central institution which is to be declared open to-day."

Turning to the nature of the instruction to be given at the College Mr. Moreland said "it may be said at once that this institution is not designed to teach cultivators their business. There is at present no scope for the college-trained farmer in the rural economy of the provinces ; and the object of the college is to train men who will be in contact with the cultivator, and—whether as officials or as owners or managers of estates—will be in a position where they can either or help hurt him. Such men require not merely familiarity with agricultural practice, but also a wide outlook on the rural economy of the country, based—as such an outlook must necessarily be—on a sound scientific training : they should be capable of detecting cases where the agriculture of a locality is returning less than the highest possible income, and they should be able to show in

practice how that income can be raised to its maximum. The course of study at the college is designed to furnish this equipment."

In a later issue we would be in a position to insert a Photo of the Institution which Mr. W. H. Fremantle, the Principal of the College, has very kindly consented to favour us with.

OTHER EDUCATIONAL ADVANCES

The Hon. Mr. Butler receives the Hindu University deputation at Delhi Town Hall at 10.30 on the morning of the 4th December.

A public meeting of the Hindu citizens of Benares attended by about 4,000 men of all

Meeting at Benares Nov. 16, 1911

classes was held at the Vissesswar Theatre for explaining the objects of the Hindu University and form a district committee for raising funds. Babu Bhagwandas, Secretary, Central Hindu College, presided. Mr. G. S. Arundale in his address said that so far Benares was concerned the University was an accomplished fact, and that he believed that for India it was impossible to progress unless education was based upon religion. Mr. Arundale also remarked that they wanted the Hindu University to be to the students what the mother was to her children who would imbibe the true spirit of the service and by serving the University they would serve their country.

The Deputation arrived at Sitapur on the morning of Sunday the 12th November. At the meeting about 5000 people assembled. All the important taluqdars of the district, The Deputation's Tour raises, bankers and pleaders attended the meeting. Thakur Suraj Bux Sing was voted to the chair. The speeches by the members of the Deputation then followed, Pandit Madan Mohan Malaviya spoke last. Referring to the convocation address of his Honour the Chancellor of the Allahabad University regarding denominational Universities, he said that he hoped that the degrees of the Hindu University would not only be not lower but, he ventured to say, higher in standard than the degrees of the existing Indian Universities. In addition to the sum of one lac of rupees already subscribed by Thakur Suraj Bux Sing, Rs. 75,000 more were subscribed.

The Deputation visited Etawah on the 16th of November where a public meeting was held at Victoria Hall grounds on the same evening. The meeting was attended by over three thousand people.

The Deputation next visited Bahraich on the 18th and Barielly on the 20th instant. At Bahraich Rs. 40,000 was announced.

The Una subscriptions now amount to Rs. 93,000. The Rae Bareilly subscriptions amount to Rs. 25,000 and of these Rs. 20,000 has been subscribed by the Hon. Raja Rampal Sing C. I. E. of Karri Sudhohi.



The volume published by the Board of Education in England entitled "Statistics of Public Education in England and Wales, Part I, Educational Statistics 1909-10" a summary of which is given in the *Times*, shows the progress made in respect of all grades of education. We learn that on July 31, 1910, there were in England and Wales 21,199 schools providing accommodation for 7,082,800 children. Voluntary Schools numbered 13,044 with 3,114,708 places, and there were 8,155 Councils accommodating 3,968,092 children. The denominational schools and their accommodation were as follows:—Church of England, 11,008 schools and 2,468,062 places; Wesleyan, 242 schools and 81,477 places; Roman Catholic, 1,073 schools and 391,864 places and Jewish, 12 schools and 10,554 places. Classed as "Undenominational and other schools" were 522 schools, with accommodation for 136,177 scholars. In the certified schools for the blind there was accommodation for 2,213; deaf, 4,167; mentally defective, 11,689; physically defective, 4,418; and epileptic, 464. In England, 316,581 girls attended cookery classes, while 174 boys attended similar courses. Other special classes were attended as follows:—Laundry work 118,160; housewifery 24920; combined domestic subjects 6,768; dairy work 130; gardening, 1,022 girls and 32,276 boys; handicraft (other than light wood work), 223,591; and light woodwork, 882. The number of grant-aided secondary schools in England was 841, with 8825 teachers and 141,136 pupils. There were also 35 recognized technical institutions the number of teachers being 736 and the number of students on account of whom grants were made 2,584.

*The True Indian Ideal of Learning**

BY

THE HON. MR. V. KRISHNASWAMY IYER.

Learning in this land has always had an exalted place. It marked out a whole class for pre-eminent honour and distinction. *Arthakaricha-vidya*, learning which brings in gain, has doubtless been one of the aims of life. But a higher ground for the acquisition of knowledge was the Upanishadic teaching, 'Whatever one does, if done with knowledge, yields greater results.' '*Yadeva vidyaya karoti tad viryavattaram bhavati.*' The transcendental ideals of the Indian systems of philosophy which scorn the delights of a material world, the doctrines of Karma and Reincarnation dominating Indian thought and life which reconcile the student to the indefinite postponement of all recompense for labour, and the overwhelming accumulation of ritual as a part of religion, have assigned to learning and its votaries a place in national life almost unapproached in the history of other ancient lands. The early period of life, extending over twelve to twenty-five years, was in the case of every man of the regenerate castes ordained for study with the teacher. The sciences and the arts were open to all, though on the Sudra their cultivation was not binding. The goddess of learning, wife of the Creator in the Divine Trinity, has an annual festival in her honour observed by all Hindu castes and communities. 'Knowledge for knowledge's sake and not for the gain it gets, the praise it brings and the wonder it inspires' has been held aloft as the highest end and aim of education. Let not modern conditions of life darken the splendour of the ancient ideals of learned poverty, before which even the diadems of kings have rolled in the dust.

The University as a community of teachers and scholars and a nursery of lofty ideals and large

aspirations is not a modern idea or one peculiar to the West. The *Parishads* of post-vedic times like the one in which Svetaketu Aruneya was, according to the Brihadaranyaka, confounded by King Pravahana's questions propounding problems of philosophy, the priestly congregation in *Sangharamas* of Buddhist days like the great halls of Nalanda spoken of by Hiuen Tsang, the *Sangams* of the Tamil country whose fame lasted many centuries and the last of which sang the praises of the immortal *Kural*, the mute organizations of more modern times dotted all over the country, were all gatherings of the most learned and thoughtful men of the day, engaged in religious philosophic and scientific studies or discourses, and centres of highest culture.

Religion has always fed the lamp of learning. Cathedral and monastic schools pioneered the way to the mediæval *studia generalia* of Europe, parents of universities like those of Bologna and Paris. So in India the premier class and the monastic orders in their quest of God and their search into the mysteries of the universe gathered in groups in forest or mountain solitudes to learn and to teach. The temporal power stood aloof for many centuries from the cloisters of learning in Western lands. But it was the privilege and the boast of Kings in India to make their court the arena of intellectual combat amongst the learned of the land and to proclaim themselves the patrons of poets, philosophers and sages. It often occurred that Brahmins who had sought retirement and Kshatriyas who had renounced their sceptre, *Vardhake munivriithayah* in the words of sweet Kalidasa, attracted disciples by the boldness of their speculations and the sanctity of their lives. It has also happened that individual teachers of great personal sanctity and renown established themselves in historic places of pilgrimage and gathered students around them from various parts of the country who lived with their teachers and served them in humble ways during the period of studentship. Benares, of all cities the most sacred in the world, with a longer record as a centre of thought and learning than Athens 'the mother of arts and eloquence,' or

* Being a part of the convocation address (Madras University) delivered by the Honourable Mr. V. Krishnaswamy Iyer on Thursday the 23rd November, 1911.

imperial Rome, long the seat of unparalleled temporal and ecclesiastical power, or historic Paris of varied interest and widest culture, or London, the gate of the world's commerce, Benares has exercised the most powerful charm on the Indian mind for ages, not less for her illustrious roll of teachers than for her being the gateway to heaven for the pious Hindu who heaves his last breath on the holy ground enriched with numerous temples. The tragedy of King Harischandra's life which has indelibly impressed upon the hearts of Indians the Vedic formula that there is no religion higher than truth, *Satyanasti paro dharmah* was enacted there. Gautama, the lord of the Sakyas, abandoning his royal heritage, sought within its precincts the way to salvation though all the learning of the age gathered on the spot which marked the confluence of the Ganges with the Asi and the Varuna. Sankara, perhaps the most profound of philosophers, ancient or modern, carried to Benares his daring speculations and the truths he saw with vision divine for the approval of the mighty in intellect. Learning and knowledge have for centuries shed their radiance around from other famous seats as well, like Madura and Navadvip. The inheritors of a past so glorious, the descendants of generations to whom the cultivation of knowledge was a religious dedication, can need no other incentive to literary, scientific or philosophic pursuits than the conviction that knowledge is its own reward.

A few Stray Thoughts on Kalidasa.

It is again urged that in the Rajatarangini when Hiranya, the ruler of Kashmira breathed his last without an issue, Harsha Vikramaditya of Ujjain is said to have appointed a poet named *Matrigupta*, who had come to seek service in his court, to the throne of Kashmira. This Matrigupta ruled Kashmira for four years and then retired to Benares as a *वृत्ति*, when Pravarasena II, Hiranya's nephew, was installed to the Throne. Dr. Bhau Daji thought that this Matrigupta was the great

poet Kalidasa. The Doctor supported his theory thus:—(1) there always has been a tradition that Vikramaditya was so pleased with Kalidasa that he bestowed on this poet half of his territories. (2) Matrigupta is rather an appellation than a proper name and it conveys the same import as Kalidasa. (3) The Rajatarangini does not omit to notice the great Sanskrit poets in their respective historical periods. Thus it mentions *Bhababhuti* as patronised by *यशोधर* of Kanoj. But it never mentions Kalidasa. (4) A Prakrita poem called *Swetukavya* is described by its commentators to have been composed by Kalidasa at the request of Raja Pravarasena. An expression in the *वाराणसी दर्पण* of *Sundara* is explained by the commentator Ramasrama to be an allusion to Kalidasa who wrote the *Swetukavya*. The Rajatarangini states that Pravarasena had constructed a bridge of boats across the Vilasta (Jhelam) on which the capital of Kashmira was then situated. The construction of this bridge was the subject-matter of the *श्वेतुकाव्य*. But the Doctor, himself, brought forward some objections against his identification of Matrigupta and Kalidasa. Kalidasa, according to him, was a Saraswat Brahmana, a worshipper of Siva and Parvati, while as a ruler of Kashmira appears from the Rajatarangini to have conciliated the Buddhists and the Jainas by prohibiting the destruction of living beings. Prof. Max-Muller is at a loss to consider as to how *Kalhana Pandit* who is so well acquainted with the literary history of his country, should have told the extraordinary career of Matrigupta without even giving a hint that this poet, raised to the Throne of Kashmir, was the famous Kalidasa (21). The above statement leaves the identification of M and K very doubtful. Again the famous Kashmirian poet Kshemendra of the eleventh century distinguished between Matrigupta and Kalidasa. In his *श्रीबिम्बविचारवर्षा* or more properly *श्रीबिम्बविहारवर्षा*, he quoted from both Matrigupta and Kalidasa (22). Kshemendra

(21) India what can it teach us. pp. 307 315 foot note.

(22) Dr. Peterson's paper on the date of Patan jali. p. 27.

also quotes two stanzas from the *सेतुबन्धकाव्य* in his *श्रीविद्याह्वार* and ascribes them to Pravarasena. There is a commentary on *अभिज्ञानशकुन्तलम्* by Raga-va bhatta, son of Pritwidhara of Visweswarapattana (Benares) in which he distinctly quotes Matrigup-tacharyya with reference to the characteristics of dramatic composition. Thus there is no shadow of doubt that M and K were two different persons.

Again Mallinatha, in his commentary on the 14th stanza of the *पञ्चमेय* of K's Meghaduta, discovers a pointed allusion of Kalidasa's words *निटुल* and *दिङ्नाग*, two persons who were contemporaries of Kalidasa, one his intimate friend and the other his adversary. About *निटुल* nothing absolutely is known. But *दिङ्नाग* or more properly *दिङ्नागाचार्य* is a celebrated name in Sanskrit Logic. From the life of *भगवद् बुद्धदेव* by Ratna Jhar Maraja of Tibet, we learn that *दिङ्नाग* and *चन्यकोर्ति* were pupils of the Buddhist *आर्यश्रवण* in Logic. Again from Vachaspathimisra's *न्याय बार्तिक-तात्पर्यटीका* we learn that *उद्योतकराचार्य* composed his *न्यायबार्तिक*, a commentary on *पद्मिनस्त्रामिन*'s *न्यायभाष्य* in order to clear away the erroneous interpretations of *दिङ्नाग* and others. This shows that *उद्योतकर* was a contemporary or immediate successor of *दिङ्नाग* and that the latter was an authority on logic. From Taranatha's History of Buddhism we know that *आर्यश्रवण* was the elder brother and teacher of *बसुबन्धु* (23). Hiouen-thsang tells us that *Vasubandhu* and his teacher Manorhita were contemporaries of Vikramaditya of Sravasti (24). Now if we can fix the dates of this Vikramaditya and Asanga or Vasubandhu, we can also fix that of Dignaga, who according to Mallinatha was a contemporary of Kalidasa. Again, Hiouen-thsang says (629-645 A.D.) that sixty years before his time the Throne was occupied by Siladitya Pratapasila. His reign, according to Dr. Fergusson ends in 580 A.D. He ruled according to Ferishtah for 50 years (530-580 A.D.) and was preceded by Vikramaditya whose reign would

accordingly have ended in 530 A.D. Again the Tibetan chronicler Ratnadharmaraja says that 900 years after the *Nirvana* of Buddha there appeared Asanga and Vasubandhu. Hiouen-thsang says that Asoka reigned 100 years after Nirvana. Now the date of Asoka is known to be 263-229 B.C. Asanga and Vasubandhu thus appeared to have lived in 541 A.D., and Dignaga, the celebrated pupil of Vasubandhu must have lived about that time. Thus according to Mallinatha the end of the 5th and the beginning of the 6th century must be the time when K flourished. But Mallinatha, with all his profound scholarship was not a reliable antiquarian and as such we can not accept his guess suggestion, so long as it is not confirmed by documentary evidence; and documentary evidence of Dr. Fleet from the Mandasor Inscriptions conclusively proves that Vikramaditya, the founder of the Samvat era reigned in the first century before Christ and hence Kalidasa also lived then. Besides, the Brihatkatha and Merutenga's Patavali support Dr. Fleet's theory.

Again some antiquarians hold that 'the Hindu tradition which makes Kalidas contemporary of Vikramaditya, the founder of the era commencing B.C. 57 does not help us towards the solution of the problem, because the earliest inscriptions mentioning this era, which have been discovered in Malava, speak of it as the *Malava era* and do not connect it with Vikramaditya as its founder.' But Dr. Fleet from the dates of his Mandasor inscriptions, has, with astronomical conclusions, conclusively proved that the *सम्वत्* or sam era to be identical with the Malava Samvat or Malava Kala.

We may therefore easily form the correct conclusion that Kalidasa lived towards the end of the first century B.C. This is also supported by such internal evidences as can be gathered from his works. In *Sakuntala*, Vikramorvasiya and *Raghuvamsha*, the poet distinctly refers to the *यवन*, the Parasikas, the Hunas, the Kambojas, the Kalingas, and other foreign tribes and races and their kingdoms bordering on the frontiers of India. Kalidasa's descriptions closely resemble the national customs of the foreign races, tribes and kingdoms at the time about which Kalidasa is supposed to

(23) Taranatha's History of Buddhism—p. 118.

(24) Buddhist Records of the Western World Vol I, pp. 106-109.

have lived *i.e.*, towards the end of the 1st century B.C. In his *Raghuvamsa* (Canto iv), Kalidasa, while describing the conquest of Raghu, declares that his hero invaded the Northern countries on the Indus where saffron (कुङ्कुम) is cultivated and there he encountered the Huna kings whom he defeated and killed in battle. The Northern countries were Kabul, Kasmira, Panjab, and the neighbouring provinces of the North. Here we have to refer to the Chinese chroniclers for information. Rev. S. Beal says—"the great Yuchi (who had been driven from their northern frontier of India) being relieved from pressure, were able to consolidate their power, so that about 100 years after Chang-Kian's embassy (*i.e.*, about 30 B.C.) the five tribes into which they had separated were united under Khient-Sin-ki, the chief of the Gusan horde of the Huns; and thus united proceeded to advance further south to the conquest of Kashmira, and Kabul. It is conjectured that the chief, Khian-tsin-ki, who thus consolidated the power of the Yuchi is the same as Hykodes of coins who effected his conquests about 50 B.C., and died in 35 B.C. This chieftain left his throne to his son Yen-kao-ching, to whom the Chinese assign the conquest of India to the West of the Jamuna. He has been identified with Hima Kadphises of the coins." We have distinct allusions to these *Hunas* in the *Mahabharata*, a work that existed long before the Christian era. From the Chinese accounts it is quite clear that the Hunas were very powerful kings and had established a vast empire from the middle of the 3rd Century B.C., to the close of the 1st Century A.D., on the frontier of Bactria. And K's reference to them was not confounded. Some here assert that Raghu as described in the poem is more or less a mythical hero and his conquest is only mythical as it is not confirmed by the *Ramayan* of Valmiki, the source of K's poem. Our answer here is Raghu is not a mythical hero (he is a historical character) and that Valmiki's *Ramayana* is not the only source of Kalidasa's Raghu. For Cantos ix—xv, he is indebted to Valmiki; here too in minor details he has not followed Valmiki. Kalidasa composed his *Raghuvamsa* not directly from Valmiki's Ram-

ayana but from the various accounts and episodes of different types of *Ramayana* or some other ancient works. About the different types of *Ramayana*, Aswaghosha in his *Buddhadeva charita* says—

बाल्मीकी नाट्य समर्ज पद्यं ज . न्य यज्ञ च्यवनो महर्षिः ।

विक्रितं यच्च चकार नात्रिः पञ्चासदात्रेय ऋषिर्जगद् ।

From the above verse we learn that Chyavanas' *Ramayana* was anterior to that of Valmiki. That there were other types of *Ramayana* is corroborated by a different version of the *Ramayana* in the *Kathasarit Sagara* of Somadeva (pp. 287-582) which is only a close Sanskrit translation of Gunadhy's *Brihatkatha* of the close of the 3rd Century B. C. It is also corroborated by the *जानकौह्वर* of Kumara Dasa where the main story is preserved, but difference is noticed in small details. Besides these works even *Mahabharata*, *Agnipurana*, *Padmapurana* and many other Puranas contain the account of the *Ramayana*. In these the main story is just the same, but difference is observed in minor details. From this it follows that Kalidasa and the authors of these Puranas and the different versions of the later *Ramayan*s had probably a common source to draw upon. Kalidasa, it appears, had prepared his list of the Raghu race either as was given in the ancient Purans or from the family pedigrees of some dynasties or some other that was in tact in his time before the beginning of the Christian era.

Kalidasa in the *Kumara Sambhava* (VII, 1.) says :—

अनीषधीनामधिपत्यं ब्रह्मो तिथीच जातिव्रगुणान्वितायाम् ।

समेतवन्तु हिंसवान् सुताया विवाहदौष्टाविधिमन्त्रिष्ठम् ।

The word *Jamitra* used in the sloka, is, according to the antiquarians, a corrupt form of the Greek term *diametron*. It is possible that these terms must have been borrowed from either the Greek astronomy or from the Chaldeans or the Egyptians. Professor Maxmuller says that the Greeks received the science of astronomy from Babylon about 700 B. C., (25). In the time of Endoxos (380 B. C.) the Greeks though

they had twelve divisions (introduced by Kleostratos of Tenedos, 496 B. C.) had but eleven signs, the two divisions, now represented by scorpion **वृश्चिक** and balance **तुला** being represented by one sign only, the scorpion with its claws stretching across two divisions. Now whatever may be the historical state of these sciences of astronomy and astrology before the beginning of the Christian era, it is certain that these sciences had an early beginning in India and that the judicial astrology based on the Zodiac was introduced and assimilated by the Indians somewhere between the fifth and the third century B. C. In the *Bandhuyana sutras* we read **मेघ वृश्चिकी द्यौरी वसन्त । मौन मेघी न ।** We also find in the *Ramayana* distinct allusions to the **राशि** (signs of the Zodiac) (26) From Valmiki's use of the signs of the Zodiac, it is clear that the astronomical terminologies had its existence in India, about one thousand years before A. D. 476 (i.e. the time when Aryabhatta was born in Pataliputra). Prof. S. B. Dikshita in his *Early History of Indian Astronomy* gives the history of the five astronomical Siddhantas in their chronological order. The following is the order—(1) Paitamaha (2) Vasistha (3) Panlisa (4) Sanra and (5) Romaka. From its affinity with the Vedanga-Jyotish and with other proofs, the learned professor assigns to *Vasistha Siddhanta* the period after the Vidanga Jyotish. The names of the signs of the Zodiac first occur in the original and the ancient *Vasistha Siddhanta*, and not in that composed by Vishnuchandra (27). The learned astronomer asserts that the composition of the said *Vasistha Siddhanta* should be placed somewhere between 500 B.C. and 300 B.C. According to him the *Romaka Siddhanta* had its origin bet. 150 B.C. and 150 A.D. The *Ramakasiddhanta*, according to him, was composed according to the principles of Hipparchus and at the time when it was introduced in India, Ptolemy's astronomical works were not yet known. But a close affinity existing bet. the theories of

Hipparchus and Ptolemy, amateur astronomers commit the mistake of calling *Romaka Siddhanta* only an abridgement of the works of Ptolemy. Thus *Kalidasa* derived his knowledge of astrology from some astronomer of the first century B.C. and not from Aryabhatta.

(To be continued)

U. N. VIDYAVUSHANA.

Is space an extramental reality ?

If we examine the history of Philosophy from its earliest dawn to its modern development we can see that the question of space—its origin and nature—has been variously discussed by the greatest philosophers of the world—but to no effect. And to prove the maxim, a cynic might be tempted to add, "Philosophy begins in ignorance and ends in learned ignorance"—the question remains still an open one.

Before entering into the main subject it is desirable to explain the terms "extramental" and "reality"—for much would depend upon the view that we take of these.

Now what is 'extramental'? Berkeley's entirely subjective Idealism is not the theme of to-day—we do not hold with him that there is no objective world, and that all sensations and feelings come directly from God—what we maintain is that there is an objective world, but that not existing apart from the mind that perceives it. There is an objective world—there is no denying it—for without that knowledge would be impossible—for all knowledge, as even such a strict Idealist as Fichte admits, implies a distinction of a "subject knowing" and an "object known." But the difficulty is about this object. Does it exist *par se* apart from the subject—as an extramental reality which would continue to exist even if all minds finite and infinite were annihilated; criticisms of the crude realism of Descartes and Spinoza by Berkeley and Hume on the one hand and Kant and Hegel on the other, have undeniably shown that object—the objective world—cannot exist apart from the knowing

(26) **रामायण** Book I. canto 18 verses 9, 15. *Ramayana* Book II canto 15 verse 3.

(27) There are two *Vasistha Siddhantas* one original and old, and the other composed by Vishnuchandra pp. 151 and 155.

subject, that is, it can not be an extramental reality, and indeed, as some would say, the very term extramental is a pure misnomer. In a wider sense however, we might take, following Fichte, an extramental world to mean "the objectification of Ego by the Ego itself."

Let us now pass to the second question, 'what is real'? Philosophers are not at one as to the answer they give to this. The sensationist, for example, Hume, Mill, Bain, Sully and others, would agree in saying that 'phenomenal' alone is 'real'—in fact we can know nothing but phenomena and these are realities to us. A 'reality' beyond these phenomena is perhaps an illusion—thus what we touch with our hands, smell with our nose, and see with our eyes, is alone real. The absurdity of this view is of course *prima facie* evident. A phenomenon means a 'change' (and they admit it) and a change is any thing but real—for 'reality' as our old Buddhists remarked long ago, is equivalent to 'permanence.' True it is that the phenomena are changing—but there is a continuity in their change (for without this the universe would be a chaos). There is in short a permanent 'immutable essence'—the Idea—that realises and is realising itself in and through these phenomena and which itself never changes—and this is 'reality.' Though the whole universe is nothing but a 'system of relations', as Green says—an 'aggregate of phenomena', as a sensationist would say—still as Green argues, there must be "something which renders all relations possible" and supplies "the unity of the manifold" which is involved in the existence of these relations—and that is 'reality.'

A question, again, is generally discussed as to whether "reality" can be in consciousness. Popularly it is held that 'appearance' is in consciousness while 'reality' must lie outside of it, but this is only a crude unwarrantable assumption which we may well afford to dismiss with a quotation from Spencer. "Though reality under the forms of our consciousness is but conditioned effect of the Absolute Reality, yet this conditioned effect standing in indissoluble relation with its unconditioned cause, and being equally persistent

with it so long as the conditions persist, is to the consciousness supplying those conditions, equally real". Thus by "reality" we mean, to use simpler language, a centre of energy and force that lies beyond the phenomena and that manifests itself in and through these phenomena and which cannot lie beyond or outside consciousness.

Now, to begin our subject. We can trace a gradual evolution in the conception of space among philosophers—beginning with the naive common sense view of space as extended outside the realm of consciousness to the view that space is a "pure subjective force of our sensibility" having no objective reality of its own.

In the body of this article we will have to mainly concern ourselves with the Ontology of space but occasionally we shall have to enter into its Epistemology and Psychology.

Space, according to Descartes, is 'real' and independent of the human subject and is the essence of all corporal existence. But this view leads to the metaphysical question of the relation of Mind and Matter, i.e., filled space. To obviate this difficulty Spinoza makes space to be the attribute of the eternal, immutable substance; but we know how, this instead of removing the difficulty creates new ones, for Spinoza does not explain how the eternal substance which is neither material nor spiritual, can manifest itself in space. Newton and Clarke agree in making space a real extended substance containing all things—but this is certainly going too far for they do not and indeed can not explain how such a space can enter into our consciousness. In modern times Dr. Martineau (following Tendelenberg and Hamilton) renews the same view, nay, he goes much further and says that space—pure space—is a condition of God's activity. He locates everything in space—thus he says "the dualism (of self and not self) must also carry a geometrical antithesis of 'here' for the 'self' with its contents and 'there' for 'not self' and its contents involving space". Can we not almost say that Martineau verges on towards materialism by trying to locate even mind in space? He goes even much further, I think, when he intimates that the soul after

being liberated from the body cannot be, after all, quite free from all spatial relations. Such is the common realistic view as we have described it and there are insuperable difficulties involved in it. If space be something apart from and independent of the subject—how can one come into any relation with the other? Can any relation ever exist between two entirely heterogeneous substances? Again, the realists, saying as they do, that space is an independent reality which can be “represented” or “intuited” in mind, are bound to admit the existence of “two spaces” one mental and the other real,—now what, then, will be the connection between these two? What grounds have we for saying that one is a representation of the other? Again, as for the creation of space, how can the Infinite Mind realise itself in space—the realists as opposed to the Hegelians do not certainly admit God can make two logical contradictions possible at the same time.

These difficulties, serious as they are, lead some to seek refuge with the Empirical Idealists.

It was Berkely, among the Modern English Philosophers who first taught the doctrine of the unreality of space. Space, he says, is purely subjective being given in and with the particular impressions of sight and touch and these impressions come directly from the “Creative Spirit” himself. Thus, with him, space is purely phenomenal, with no objective reality whatsoever—the aggregate of sensations making up the idea of space is infused, as it were, into our finite mind by the Infinite Mind. But then, as we all know and as Hume has indubitably proved, this is but a partial conception. And, moreover, Berkely leaves it altogether unexplained how the Infinite Mind can act upon the Finite Mind in this way. What arguments does he advance to show that the idea of space comes really from an Extraneous Source? These were the difficulties that led Hume, Mill, Bain and others to the Extreme Empirical Idealism. They do not dogmatically assume an Infinite Creative Spirit as the “Deus Ex Machina” of all our sensations and ideas. They make sensations to be the ultimate, inexplicable and undecomposable units of all our knowledge.

Thus given a mass of such sensations with the laws of assimilations and differentiation acting (but of course no agent to *make them act*) we get two groups of such sensations—one, the vivid group and the other, the faint group, to borrow Spencer's phraseology,—the former forces the Ego, the latter, the Non-Ego. Again, from the latter, a certain number of sensations of touch and sight congregate together and form the idea of space. Thus, the idea of space, though only made up of sensations which mean to us only changes, is *real*—as *real* as the Ego itself. It is not *real* in the sense of being ultimate but *real* as being made up of ultimate units. But this so-called reality, we know, is no reality at all—it is entirely phenomenal and subjective in the sense of being made up of sensations—sensations that inhere in and make up a subject. But this view, though consistent and thorough going involves a psychological and logical absurdity. It explains ‘subject’ by sensations, but what are sensations apart from the ‘subject’? Do they not thus unnaturally divorced from the subject, become mere meaningless and empty abstractions? Sensationists, it seems, are too much influenced by the idea of the Nebulous Mass forming “the stupendous fabric of this universe by the physical law of gravitation”—thus Mind and Matter—Time and Space—become so many detached rings, as it were, torn off from the original mass by the Laws of Assimilation and Differentiation. But what is the meaning of a ‘law’, without a conscious Mind to apply and interpret it? Again, the sensationists would derive the idea of space from co-existing sensations—but sensations, in order to be known as sensations, require the idea of space readymade there. Are sensations at all possible without a space to localise them in? Thus, explaining sensations by space, and space by sensations, these philosophers fall into the dangerous logical fallacy of ‘petitio principii.’

(To be continued)

SITARAM BANERJI

Sydney Carton.

A CHARACTER IN DICKENS'S TALE OF TWO CITIES.

Sydney Carton was a briefless barrister of London. He acted as an assistant to another lawyer of a rather promising career—Mr. Stryver. But though the latter was a rising advocate and the former only a subaltern, yet it cannot be gainsaid that the assistant was more worthy than the principal. It is a fact, made conspicuous not only by the current of events, but also openly avowed by Mr. Stryver. The questions, which Carton suggested to his senior, were particularly pointed, the summaries of cases, wherein Carton assisted Stryver, were done with admirable haste and correctness. Yet Carton was junior to Stryver, and remained so till the last glorious moment of the former's existence in this dreadful world.

Many a time did his friends and well-wishers admonish Carton, for his reckless habits, which only ruined his prospect at the bar. It has been said by distinguished critics, that every character of Dickens holds a ticket, by which it is known, that is to say, a peculiar eccentricity marks every single character which Dickens has painted in his ever-refreshing novels. Mr. Micawbar and Miss Trotwood in *David Copperfield* are each peculiar in himself or herself. The character of Nancy in *Oliver Twist* is singular. Mrs. Nickleby is eccentric; so is Ralph Nickleby in *Nicholas Nickleby*. In the same manner, Mr. Lorry has a peculiarity by which we know him. He is always for the Tellson's and is never himself, and it is his "business" that marks him out as one among the multitude. Sydney Carton wears the ticket *carelessness*. Indeed, such a careless man was hardly known before. The whole life of the man was a long series of this attribute. When at school, he would often do exercises for others, and never do his own. In life, he acted for Stryver, and would not mind his own business. At death, he replaced Charles Darney, and thus gave birth to a glorious tale of self-sacrifice and devotion—a supreme example of "carelessness," or rather of selflessness.

There are two sides of the character of Sydney Carton. He was a man and he was a lover. Our first meeting with him does not place him in a very favourable light before us. An apparently careless member of the bar, standing with his eyes fixed on the ceiling, is a figure, which is not, after all, something very imposing and impressive. But even at this instance, he gave proof of his keen intellectual powers, which characterized him to his last living day on earth. The shrewd point, which he suggested to his senior, (in the paper he threw), did most—nay all,—to turn the tide of the case in favour of the defence counsel. We may say, that but for this "careless" man, looking at the ceiling, the body of Darney, would have been slinging from a rope at Newgate. But Providence willed it otherwise, and had Carton for his agent to execute his purpose. Methinks Carton was created for the sole purpose of being the protector of Charles Darney. In two instances, he was instrumental in saving the life of Darney, the last of which is inseparably associated with a heroic tale of self-sacrifice, that deserves to be written in flaming letters.

Though "careless," one would be far out of the mark to say that Carton was deficient in intellect. Many a time had the senior praised the junior for his keen comprehensive power, and reproached him for allowing that excellent attribute lie dormant in him, and thus suffered to get blunted and become absolutely useless. The reply, which the junior invariably gave to such admonitions, was characteristic of him.

"Carton", said his friend, squaring himself at him with a bullying air, * * * * "Your way is, and always was, a lame way. You summon no energy and purpose look at me."

"Oh botheration," returned Sydney, with a lighter and more good-humoured laugh, "don't you be moral."

"How have I done what I have done?" said Stryver, "how do I do what I do?"

"Partly through paying me to help you, I suppose. But it's not worth your while to apostrophize me, or the air, about it; what you want to do, you do. You were always in the front rank, and I was always behind."

"I had to get into the front rank; I was not born there, was I?"

"I was not present at the ceremony; but my opinion is you were," said Carton. At this he laughed again, and they both laughed.

"Before Shrewsbury, and at Shrewsbury, and ever-since Shrewsbury," pursued Carton, "you have fallen into your rank, and I have fallen into mine. Even when we were fellow-students in the student-quarter of Paris, picking up French and French laws and other French crumbs that we didn't get much good of, you were always somewhere, and I was always nowhere."

"Whose fault was that?"

"Upon my soul, I am not sure that it was not yours, you were always driving and riving and shouldering and pressing, to that restless degree that I had no chance for my life but in rust and repose. It is a gloomy thing, however, to talk about one's own past, with the day breaking. Turn me in some other direction before I go."

The above quotation gives us specimens of the strain, in which Carton would invariably reply to generous exhortations. To Mr. Lorry, he replied, almost in the same manner.

"And indeed, Sir," pursued Mr. Lorry, not minding him, "I really don't know what you have to do with the matter. If you will excuse me, as very much your elder for saying so, I really don't know what it is your business."

"Business! Bless you, I have no business," said Mr. Carton.

"It is a pity you have not, Sir."

"I think so, too."

"If you had," pursued Mr. Lorry, "perhaps you would attend to it."

"Lord love you, no!—I should n't," said Mr. Carton.'

It is as a lover that Sydney Carton appeals to our hearts to a much greater degree than as a man, he is as much as another,—greater, I think in some respects, and lower in some others. But as a lover he is unique—a towering personality, much higher than others. Who could, for a moment, believe a dissipated, careless fellow like Sydney Carton, to be capable of such a speech, at once charming and pathetic and breathing the fragrance of sincerity, as appears in the thirteenth Chapter of the Second Book of "A Tale of Two

Cities"—a chapter which brings out in bold relief the character of Carton in an entirely new capacity. I cannot resist the temptation of reproducing the concluding speech of the hopeless lover,—a speech so sweet, so pathetic in its strain.

"My last supplication of all is this; and with it I will relieve you of a visitor with whom I well know you have nothing in unison, and between whom and you there is an impassable space. It is useless to say it, I know, but it rises out of my soul. *For you, and for any dear to you, I would do anything.* If my career were of that better kind that there was any opportunity or capacity of sacrifice in it, I would embrace any sacrifice for you and for those dear to you. Try to hold me in your mind, at some quiet times, as ardent and sincere in this one thing. The time will come, the time will not be long in coming, when new ties will be formed about you—ties that will bind you yet more tenderly and strongly to the home you so adorn—the dearest ties that will ever grace and gladden you. Oh, Miss Manette, when the little picture of a happy father's face looks up in yours, when you see your own beauty springing up anew at your feet, think now and then that *there is a man who would give his life to keep a life you love beside you.*"

(The sub-lines are mine.)

Then again—

'When he cared to talk, he talked well; but, the cloud of caring for nothing, which overshadowed him with such a fatal darkness, was very rarely pierced by the light within him.'

Yet another—

'And yet he did care for something for the streets that environed that house, and for the senseless stones that made their pavements. Many a night, he vaguely and unhappily wandered there, when wine had brought no transitory gladness to him; many a dreary day-break revealed his solitary figure lingering there, and still lingering there when the first beams of the sun brought into strong relief removed beauties of architecture in spires of churches and lofty buildings, as perhaps the quiet time brought some sense of better things, else forgotten and unattainable, into his mind.'

All along a "careless" man, Sydeney Carton had nothing but blight before him. In an auspicious moment was it that the divine figure of Lucie Manette, came before his vision. It touched a cord in his heart, and set it vibrating. *It was love which was aroused in his mind;—"love"*

indeed, but not that "word too often profaned". Many a man fall in love, but in ninety-nine per cent of cases, it is self-interested and motiveful love. The heavenly "love", which is absolutely unselfish and pure, is a commodity almost unknown in this world. Who can think of laying down his life, to save the life, of his "rival" in love!—for, in essence, Darney, stood in that relation to Carton.

But what was Carton's case? He loved Lucie Manette, but would never think of marrying her,—a wretched and miserable man as he was and knew himself to be, and a confirmed drunkard. He did not lose his head, but with admirable self-restraint and prudence, hardly to be found in even a soberer mind, he kept himself from aspiring to the hand of the divine creature. He knew that he was far too low to deserve the beautiful daughter of the doctor, as his partner of life, and would never entertain a wish in that quarter; but it was his comfort and solace to find that she was his inspiration, and that though he was past all redemption, yet if any hope of reclamation remained, it would only by her instrumentality, and none else's. In the constant flow of his filthy and dissipated habits, there were moments in which he could think of better things than his pint of brandy and the low associates, and these moments were ushered in by the wholesome influence of Lucie Manette. Many a time "when the wine had brought no transitory gladness," he would be seen veguely and at random wandering near the house of his heart's angel. The expression of Sydney Carton's thought had been beautifully anticipated by a poet, about a quarter of a century senior to Dickens, in literary age:

"I can give not what men call love;
But wilt thou accept not
The worship the heart lifts above
And the Heavens reject not:
The desire of the moth for the star,
Of the night for the morrow,
The devotion something afar
From the sphere of our sorrow?"

Consider for a moment, a man of the type of Sydney Carton—a miserable and dissipated wretch,

absolutely lost, a prodigious drunkard and never minding anything but wine and low companions, consoling the poor seamstress and preparing her mind against the coming dreadful fate. The heroic act which he had done gave him strength enough to give solace and comfort to one of the fellow-sufferers. The seamstress looked up to his face and found strength therein. It was a divine strength, which Carton was inspired with and which he imparted to his sister-sufferer. Where did he get this inspiration from? It was from the fire, which had been kindled in his heart by the hallowed presence of Lucie Manette.

There comes a moment in the life of every individual, in which the stream of his life undergoes a change. At that moment, his eyes open, as it were, and reveal to him the path, which he has to take in the journey of life. It is the crisis—the catasrophe, so to say—which turns the tide of life to a direction to which it keeps for the rest of its existence. Happy is he to whom a spiritual crisis is vouchsafed, so that for the rest of his existence, he may live in a sphere absolutely pure and uncorrupted. Carton's was such a condition. It was an auspicious moment, when his eyes travelled on the excellent creature, the "fair witness" at the old Bailey trial. The light of the "love", that grew up in his mind, at that significant moment, opened a vista, before the hitherto wretched tippler, and revealed to him the right path of salvation.

Carton's was not a piece of histrionic diffuse with the childish prattlement of commonplace attachment, but sincere and active adoration, redolent of the aroma of heaven. An instance of "love and be wise", is here—"love" that does not lose itself within the overwhelming sea of vapid sentimentalism; "Love that does not alter, when it finds alteration, but strengthens itself in order to make amends for the defect in others."

"Things base and vile, holding no quantity,

Love can transpose to form and dignity."

The vilest of creatures is transmuted to the noblest of souls, after having passed through the fire of love,

Is there a contrast between the natures of Carton, before and after the momentous trial at the Old Bailey. I don't think there is. The character of Carton is all of a piece. The first impression, which one has when he sees Carton "fall in love", is that suddenly his (Carton's) nature has undergone a radical change; that anyhow his roving and dissipated mind has given place to a healthier substitute. But on a deeper introspection it would be clear that it was very like Carton to "fall in love"—the affair was not at all foreign to his nature. If anyone in the whole group of personages in, "A Tale of Two Cities", was susceptible of this sentiment, it was Sydney Carton. Mr. Lorry was wholly unimpressible, and the never "committed the error of falling in love"; Dr. Manette was introduced to us, when he was far too old to think of it, nor would the circumstances favour such a luxury; Stryver never fell in love except it was with money or at best with bullying and bravadoing. It was Carton, who knew what is love and was capable loving, as also being loved. He never loved once in his life, and hence it was that he could love so deeply, so sincerely and so disinterestedly. His mind was a *tabula rasa*, sensitive to a high degree, ready to take in any impression that might appeal to it; and the moment the appealing figure came before it, the latter at once caught the reflection on its keenly sensitive surface, and kept it there to the end. Nay more—there was diffused a celestial halo, all around, which revealed the path of human duty—*viz.*, the divine idea of self-sacrifice. It was a beacon light to guide him. Carton saw it, followed it and at last reached Eternity—the ultimate goal of man.

AJAX.

STUDENT'S SECTION.

DRESS: EUROPEAN AND INDIAN.

In comparing European dress with Indian dress, we are at once confronted with a somewhat serious difficulty. India is peopled by such a

large variety of races having different civilizations, manners and customs that all the modes of dress current in this vast continent can scarcely be adequately described. Here, side by side with the starknaked aboriginal, we find the magnificent Mahomedan, anglicised Parsee, the semi-mahomedan Sikh, and the simple yet graceful Hindu. And among Hindus themselves, there is such a manifold diversity that the Mahratta, the Guzerati, the U. P., the Bengalee, and the Madrasce costumes have not many characteristics in common.

In spite of this difficulty, however, there are such striking differences between European and Indian costumes, that they cannot be missed even by the most superficial observer. European costume, in general, is complex, utilitarian, trim and costly; while the Indian is for the most part simple, graceful, loose and inexpensive. The complexity and costliness of the former as contrasted with the simplicity and cheapness of the latter, are easily marked. A European suit consists usually of not less than half a dozen clothes; and a man must ordinarily have at least three different suits for his daily use. Besides these principal garments, he needs have a host of other small articles such as caps, collars, neck-ties, gloves, handkerchiefs, stockings and shoes—many of them in more pairs than one. Again, he has to spend an amount of time in arranging and changing his different sets of clothes. And the richer and more dignified the person, the larger is the number of his suits, and longer is the time he has to spend. Now one need not be a great arithmetician to estimate the high cost of such a manifold clothing.

This complexity and costliness, almost startles an Indian whose simple dress, especially that of a Hindu consists, generally, of not more than three or four garments, a turband or a pheta, and a pair of shoes which he wears with his bare feet. His dress at home is still more simple. There, he wears neither the head-dress nor the shoes. A dhotee covers the lower part of his body from the waist to the ankles; while a plain native shirt or another similar yet smaller garment, which he allows to hang loosely over his shoulders finishes

his home-apparel. He need not, moreover, set apart fixed moments for his equipage; he can finish it in a few seconds. And his whole dress is so cheap that he can manage to live decently in a sum at least one-third of that required for an European costume.

European costume perhaps surpasses the Indian in point of utility. It is very suitable for brisk action. But it is not probably considered to be so graceful as ours. It is a canon of Indian art that grace consists, to a certain extent, in looseness and profusion. The many cuts and pieces of an European costume—of a male costume especially—give it a rather bare appearance than the simple, loose and profuse grace of an Indian dress. But here, the canon of European art may possibly differ. And what is grace in the eyes of an Indian, may very likely be mistaken by an European for careless extravagance.

These differences, however, are but natural. For, the manners and customs of people are highly influenced by physical conditions. The climate of all European countries being much colder than that of India, a large number of warm clothes is with Europeans a bare necessity. And as the body can be best steeled against cold by wearing the clothes close to the skin, their costume could not but be more trim and tight than the Indian. There, they cannot leave parts of their bodies uncovered as in India. They must work with all their clothes on; and this makes their dress more utilitarian in spirit than ours. Again, for the greater part of the year an Indian needs almost no clothes except those demanded by native etiquette. And native etiquette demands no more than a dhotee to cover the lower part of the body, and another loose garment to screen the remaining portion from view. And the latter too, may be dispensed with at home, without the least violation of decorum.

The differences in physical conditions also seem to explain the differences in national etiquette. This may be inferred from the fact that European etiquette, unlike the Indian, is awfully offended if a man leaves uncovered the slightest

portion of his body except the face and the hands. And these too, must often be covered with gloves, &c.

Even in such apparently unimportant matters as dress, nationality must be preserved. For nationality, to speak broadly is only the aggregate of the peculiar characteristics of a people. And since these are chiefly moulded and developed in accordance with the physical conditions of that people, they are best adapted to their happiness and convenience. But the truth is not often easily realized. The temptation arising from the hallucination that every act and mode of life of the ruling community, must of necessity be worthy of imitation, is too great to resist the common people. And they begin to imitate their manners and customs blindly. They forget that such an indiscriminate and therefore slavish imitation neither conduces to their convenience nor maintains their self respect. Yet such a slavish imitation is rampant to-day in Indian Society. Ignoring totally the æsthetic sense, the utility and suitability of indigenous costume, a large part of the people is seen to be slavishly adopting European ways of dress and bearing. Again, few of them are so bold as to adopt them in entirety which aggravates the evil. For the result of slavish imitation is a curious monstrosity neither wholly Indian nor European.

Fortunately, Indian female costume has not yet been dominated by the foreign spirit. But it has remained uninfluenced more through ignorance than a true appreciation of its beauty and suitability. Imitation of what is really more efficient and beautiful is by all means to be commended. For, without readjustment and improvement no progress can be possible. But we cannot be too cautious in using our discretion and preserving our own individuality.

G. G. JAMBHEKAR,
Student, Holkar College, Indore.

PROBLEMS.

22. (Mr. Keshab Dass De). Find a point P in the plane of a triangle ABC such that the angles PAB, PBC, PCA may be equal to one another.

23. (Mr. Keshab Dass De). On the sides of a triangle ABC equilateral triangles ABC^1, BCA^1, CAB^1 are described (all outwardly or all inwardly). If X, Y, Z be the points of intersection of $AB, A^1B^1; BC, B^1C^1; CA, C^1A^1$ respectively, prove that X, Y, Z are collinear.

24. (Mr. Keshab Dass De). A, B, C, D are four points on a circle. N_1, N_2, N_3, N_4 are the centres of the nine point circles of the triangles BCD, CDA, DAB, ABC respectively. Prove that AN_1, BN_2, CN_3, DN_4 are concurrent.

CORRESPONDENCE.

THE BEHAREE STUDENTS' CONFERENCE

To

The Editor of "THE COLLEGIAN."

DEAR SIR,

I shall be thankful if you kindly insert the following lines in your most esteemed journal.

People outside Behar know very little as to what the Beharee Students' Conference is. Yet it is an institution which deserves a few moments of serious attention at the hands of all Indians. It was in the year 1906 that this Conference saw for the first time the light of day. Since then it has been steadily growing in strength and influence. It is very significant indeed that at a time when the elderly people of Behar seemed to be sleeping, with no public spirit or animation in them to assert their own individuality, the young men of Behar should have organised themselves into a corporate body, intent upon ameliorating their pitiable condition. They had the eye to perceive that the education which they received in Schools and Colleges, left room for much that was of utmost importance to them. They wanted to supplement that education by a systematic training in essay-writing and elocution, by the encourage-

ment of the vernacular of their province and above all by the cultivation of 'esprit de corps' so pre-eminently necessary for progress in any direction whatsoever. The result was that a Students' Conference was launched into existence in Behar. Thanks to the self-sacrificing spirit and organising faculty of S. J. Rajendra Prasad B.A. (now M.A., B.L.) who was the first to suggest the idea of holding such a Conference and who to say the best, may be called the father of this Conference. How fully has the Beharee Students' Conference justified its existence can be very well gathered from the following extract from the presidential address of the Hon'ble Babu Brajakishore Prasad M.A., B.L., delivered at the Sixth Session of the Conference held at Chapra in September last. Speaking of the works the Conference has succeeded in doing the Hon'ble gentleman said :—

'It is easy to doubt and criticise but very difficult to do even an inch of solid constructive work. I would like to tell those gentlemen, who seem to know very little of the aims and objects, as also of the workings, of your Conference, that of all the public associations on conferences in our province, or in any other province of this country, if there is one, which more than others, serves a really useful purpose, it is your conference. It has given a new life to the students of Behar. It has infused a new spirit in them. The over-flowing enthusiasm, the robust optimism, the mutual sympathy and fellow-feeling, the organised co-operation and above all, the 'esprit de corps' which I see in you to-day are all the works of the Conference.'

The above testimony coming as it does, from an impartial quarter ought to be accepted without reservation. But the Conference has done much more than the above lines seem to imply. Not only, has it established an 'esprit de corps' among Beharee Students, not only has it taught them co-operation and fellow-feeling, but it has also succeeded to some extent in creating public opinion against some of the most pernicious customs that are sapping the very foundation of the Indian race and eating into the vitals of the student community thereof. It has raised a strong voice of protest against the most ugly practices of smoking and drinking among students and against the injurious system of early marriage so prevalent in Behar, and although the result achieved in these directions has not been very satisfactory, we can

yet hope the combined voice of students will prevail in the long run.

But perhaps the most important feature of this Conference is the educational facilities which it affords to all Beharee students for the cultivation of their mental, moral and physical culture—facilities other than those generally obtained in school and colleges. Under its auspices a number of prizes and medals are awarded every year to the most deserving competitors in elocution and essay-writing (both in English and the vernaculars), in music and recitation and in drawing and home industry (the last for the benefit of Beharee girls only). Side by side with this, medals and prizes are awarded for sports also, the Conference recognising full well the truth of the maxim 'mens sana incorpore sano.' But above all, what strikes us most, is its Poor Students' Fund which has been definitely opened only at the last session of the Conference, which was held at Chapra, though resolutions to the same effect were never wanting in previous sittings also. Several contributions seem to have already been made, the most notable of them being those of the Hon'ble Babu Braja kishore Prosad who has promised a donation of Rs. 200 and of the Beharee Club, Calcutta which has promised a monthly contribution of Rs. 25. We have every hope that this Fund will be a most valuable and potent factor in the diffusion of education in the most belated province of Behar.

A better and nobler justification can there never be for the existence of a purely educational conference, like the one we are describing, which is conducted by students only. If for nothing else at least for the Poor Student's Fund alone it should attract the active sympathy and co-operation of all educationists. At the same time let it be an object lesson to the students of other parts of India as to what they are capable of if only they have the mind. Let them understand that it is far nobler for them to spend their energies on organisations like this, which are sure to make them better citizens and better capable of doing good to their country and themselves than ever their elders have been.

"ONE WHO KNOWS"

SCIENCE NOTES.

THE MICRO-BALANCE (SIR WILLIAM RAMSAY.)

By means of this balance the density of niton was determined by weighing one-tenth of a cubic millimetre of the gas. The beam is a rod of silica weighing nearly one-third of a gram and there is a small pan or bucket and a bulb hung from the beam by a silica thread. A bead of silica completes the counterpoise. The case is air-tight, and changes in the load on the pan are counterpoised by varying the pressure (and thus the buoyancy) of the air in the case. By this means a difference in weight of two millionths of a milligramme can be observed.

AMOUNT OF ENERGY EXPENDED BY THE BODY.

Our bodies require that provision be made for the production of the necessary amount of heat, for keeping the heart in working order, for food digestion, for the proper exercise of the muscles and for the performance of hand and brain work. From careful calculation it appears that 2,800 foot-tons are needed daily for bodily requirements, of which 120 are required for the heart alone; and that 300 tons are absorbed for bodily work. But to ensure the due performance of bodily work, a large margin is required, so the excess production is nearly 1,500 tons, making a daily total of 4,300 tons to keep the activities of the body in good working order. To produce this, man absorbs, in food, water and air, over eight pounds weight a day, a very small sum in comparison with the results obtained. Unlike steam and other engines, the loss by friction and power is infinitesimal and goes to show how perfect a machine the body is. The physical and mental force of man arises from the sustenance he takes, and hence, attention to diet as to quantity, quality and the regularity of supply is all-important. Man must eat to live.

SENSE OF DIRECTION IN THE BLIND.

It is well known that most blind people become aware when they are approaching an object or even when an object is very quietly brought near them. There has been a great

deal of speculation and not a little experimenting concerning this sense, which has received many names—sense of obstacles, facial perception, sense of direction, feeling at a distance, and so on. The accounts that the blind themselves give of their perception are very contradictory. Some investigators have regarded the sense as a fine facial touch-sense, others as due to heat-waves, others as sensitiveness to changes of pressure in the air, others as auditory. Recent experiments of an ingenious kind made at the Institution for the Blind in Paris, have led M. Truschel to the conclusion that the perception is of an auditory nature and due to the fact that the object reflects and alters surrounding sounds. To the objection that a deaf mute has been reported as showing the power, he answers that those deaf to music and speech are often sensitive to very feeble noises.

A NEW RADIUM PREPARATION.

An extremely active preparation of radium is now produced at the Neulenhach radium works, by means of a combined acid and alkaline fusion process, which extracts the radium directly from the minerals in the form of a crude sulphate. According to A. Fischer (*Chem. Zentralblatt*, 1911, I., 1190) it is possible by this means to treat ten thousand kilogrammes of pitchblende residues and obtain crude radium chloride from them within six weeks, while ores containing ten per cent, and less of uranium oxide, which hitherto could not be economically worked up, may now be used in the preparation of radium compounds. Preparations of radium showing an activity of upwards of three hundred thousand units (Mache) per 10 c.c. are now produced at these works. Experiments have shown that radium enters the human system chiefly by inhalation and not through the pores of the skin.

SPORTING.

CRICKET

Of the important cricket matches in Calcutta during the last fortnight we may mention the following:—

November 16th—Maharaja of Natore's XI vs. The Metropolitan Institution. Played on

the Maharaja of Natore's ground at Old Ballygunj the game ended in a big victory for the Natore team by 259 runs. The principal features of the day's cricket were K. Roy's (Natore) century (102 retired) and Mehta's 82 not out. Natore's total (4 wks) was 300, Metropolitan—41.

November 16th—Free School vs. St. Xavier College. Played on the Free School Ground the game resulted in a win for the home team by 35 runs.

November 18th—Mahomedan sporting vs. Scottish Churches College. On the Mahomedan Sporting ground this match resulted in a win for the home team by 126 runs. Mahomedan Sporting 151 (9 wks). Scottish Churches College 25. The remarkable feature was Hakim's (M Sp.) bowling, he took 7 wickets for 10 runs only.

November 18th—Metropolitan Institution vs. Presidency College. On the Presidency College ground, the match resulted in a win for the visitors by 10 runs. Metropolitan—65, Presidency—55.

November 19th—Calcutta Cricket Club vs. Aryans. At the Eden Gardens the C. C. C. lost heavily by the big margin of six wickets and 61 runs. [*N.B.*—The C. C. C. had there best players engaged in the match with Nattore that very day.]

November 19.—Nattore vs. C. C. C. Played at the Nattore ground the game resulted in a victory for the Maharaja's Team by a narrow margin of one wicket and 3 runs.

November 26th—Presidency vs. Scottish Churches. On Presidency ground—a draw. Home team all out for 106. Visitors registered 98 for nine wickets.

November 26th—Metropolitan Institution vs. Town Club (B). Half day match on Town Club grounds—a draw. Visiting team was decidedly better having scored 122 for eight wickets, the home team scoring 44 for eight.

THE ST. XAVIER'S COLLEGE ANNUAL SPORTS.

The St. Xavier's College Athletic Sports came off on the College grounds on Saturday the 18th Nov. in the presence of a large gathering. There were 35 events in all arranged in five classes according to the ages of the boys. There were 102 competitors and some keen and exciting contests were witnessed.

The Hon. Mr. G. W. Kuchler, Director of Public Instruction, presided and Mrs.

Kuchler gave away the prizes. Col. J. Binning acted as referee. The Volunteer and Town Band was in attendance.

The President in a congratulatory address said a few words of cordial encouragement to the boys, after which the gathering dispersed with three cheers for Mr. and Mrs. Kuchler.

CUTTINGS

FROM

LEADING JOURNALS

THE PROGRESS OF THE METRIC SYSTEM.

THE successive stages in the adoption of the metric system are curious, if not, indeed, remarkable. While the system has been in operation, either partially or wholly, in most of the leading European countries for some time past, the British Empire seems reluctant to take a step which would inevitably lead to an enormous economy of time and labour in the numerous calculations which form an important part of industry and commerce of every kind. The decimal notation is an integral part of education in every civilised country of the world, yet its application to systems of money and weights and measures progresses only in a slow and erratic way. Among its latest recruits are such outlying parts of Europe as Bosnia and Herzegovina, where a new statute rendering the use of the metric system compulsory comes into force on September 1, 1912. Several of the little republican States of Central America, such as Honduras and Nicaragua, are already metric in their measures; even China has taken a parallel course, and absolutely refuses British units; while diminutive Malta has set an example to the whole of the British Empire by enacting that, on and after the first of January next, the use of the metric system shall be obligatory throughout the island. The efforts of Australia in the same direction at the recent Imperial Conference unfortunately proved unsuccessful, as also was the latest attempt (1907) at legislation on the subject in this country. The Decimal Association are probably taking a wise course, for the object they have in view, in endeavouring to educate the public to the many advantages and conveniences attendant upon the adoption of metric methods.—*School Guardian*.

A MODERN SCHOOL.

THE country cottager may well wonder at the modern workman's flat, and be puzzled by the bath taps and the electric light switches. If he is a philosopher he may think that he lives as sanely

really matters is the spirit of the school life. Sound education has been given in a ramshackle shed. Many of us think that the human contents are more important than the stone shell. But it will interest those of our readers who work in old and dingy buildings to hear what is the accommodation considered necessary in a modern school. The Harrogate Corporation Secondary Schools have just been extended and reopened. The basement holds laundry, manual room, boys' and girls' dining rooms, kitchen, scullery and store rooms, boys' cloakroom and lavatory. The ground floor contains an assembly hall, six class rooms, masters' room, mistresses' room, head master's room and office, girls' cloakroom and lavatory. The first floor has four class rooms, physics laboratory, chemical laboratory, balance room, store room, lecture room, commercial room, needlework room, dressmaking room, cookery room, and master's room. On the second floor are found rooms for antique art, modelling, elementary art, painting, painters and decorators, wood-carving, masters, and lavatories and cloakrooms. Adjoining the main building are a gymnasium and bicycle sheds. Truly a portentous list of rooms.—*Journal of Education*.

THE RAM MOHUN ROY LIBRARY.

Great men are their own memorials. No memorial can make them a living entity to posterity if their work does not. In that sense, they require no memorial. But their fellow-countrymen owe it to themselves to erect some enduring memorial to show that they are grateful and are able to appreciate worth, and to stimulate in themselves and their children the instinct of noble doing. It is therefore a pity that there has not yet been erected any permanent Ram Mohun Roy Memorial. The Library which bears his name is a worthy attempt in this direction, and will serve its purpose when it comes to have a house of its own. A good site has been secured in Upper Circular Road, Calcutta within a stone's throw of the house in which he lived. The design of the Library building, of which we print a reduced *facsimile*, is ready. It will cost Rs. 30,000, of which Rs. 8,000 has been realised; and there are some promises besides. We should be insulting the intelligence of our readers if we were to try to prove that this foremost of modern Indians, this enlightener of his people, this embodiment of oriental (both Hindu and Muhammadan) and occidental culture and spirituality, this prophetic type of the India that is to be, should be honoured with a memorial. The increasing number of anniversary meetings held in his honour all over the country shows that we are trying to appreciate him. We do hope that this appreciation will take a concrete shape and the Library building will soon be complete.—*Modern*

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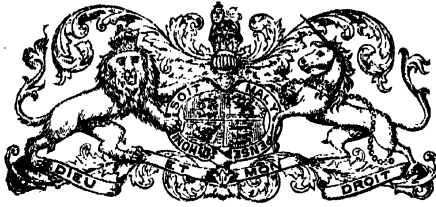
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Communications intended for publication
must be accompanied by the name and
address of the writer, not necessarily for
publication but only to satisfy the Editor.



THE COLLEGIAN

An All-India Journal of Education.

NUMBER ONE, DECEMBER.

Delhi
Coronation
Durbar
The
Royal
Proclamation

Whereas by Our Royal Proclamations bearing the dates, the nineteenth day of July and the seventh day of November in the year of Our Lord one thousand nine hundred and ten, in the first year of Our reign, We did publish and declare

Our Royal intention by the favour and blessing of the Almighty God to celebrate the solemnity of our Royal Coronation upon the twenty-second day of June one thousand nine hundred and eleven, and whereas by the favour and blessing of the Almighty God We were enabled to celebrate the said solemnity upon Thursday the 22nd June last, and whereas by Our Royal Proclamation bearing the date, the twenty-second day of March in the year of Our Lord one thousand nine hundred and eleven, in the first year of Our reign We did

make known to all Our loving subjects within Our Indian Dominions that the said solemnity had so been celebrated and to call to Our Presence Our Governors, Lieutenant Governors and other of Our officers, the Princes, Chiefs and Nobles of Native States under Our protection and the representatives of all the provinces of Our Indian Empire, now We do by this Our Royal Proclamation make announcement thereof and extend to all Our officers and to all Princes, Chiefs and peoples now at Delhi assembled Our Royal and Imperial greeting and assure them of the deep affection with which we regard Our Indian Empire, the welfare and prosperity of which are and ever will be Our constant concern.

'Given at Our Court at Delhi the twelfth day of December one thousand nine hundred and eleven, in the second year of Our reign.'

His Majesty's
Opening
Speech

'It is with a genuine feeling of thankfulness and satisfaction that I stand here to-day among you. This year has been to the Queen-Empress and myself one of many great ceremonies and of an unusual,

though happy, burden of toil, but in spite of time and distance the grateful recollections of our last visit to India have drawn us again to the land which we then learned to love, and we started with bright hopes on our long journey to revisit the country in which we had already met the kindness of a home. In doing so I have fulfilled the wish expressed in my message of last July to announce to you in person my Coronation celebrated on the 22nd June in Westminster Abbey, when by the grace of God the Crown of my forefathers was placed on my head with solemn form and ancient ceremony. By my presence with the Queen-Empress I am also anxious to show our affection for the loyal Princes and faithful peoples of India, and how dear to our hearts is the welfare and happiness of the Indian Empire. It is moreover my desire that those who could not be present at the solemnity of the Coronation should have the opportunity of taking part in its commemoration at Delhi.

'It is a sincere pleasure and gratification to myself and to the Queen-Empress to behold this vast assemblage, and my Governors and trusty officials, my great Princes, the representatives of the peoples and deputations from the military forces of my Indian Dominions. I shall receive in person with heartfelt satisfaction the homage and allegiance which they loyally desire to tender. I am deeply impressed with the thought that a spirit of sympathy and affectionate goodwill united the Princes and the people with me on this historic occasion. In token of these sentiments I have decided to commemorate the event of my Coronation by certain marks of special favour and consideration, and these I will later

on to-day cause to be announced by my Governor-General to this assembly.

'Finally I rejoice to have this opportunity of renewing in my own person those assurances which have been given you by my revered predecessors of the maintenance of your rights and privileges, and of my earnest concern for your welfare, peace and contentment. May the divine favour of Providence watch over my people and assist me in my utmost endeavour to promote their happiness and prosperity! To all present feudatories and subjects I tender our loving greeting.'

* * *

The announcements made at His Majesty's command at the Delhi Durbar by the Governor-General deal with several subjects. We quote the following extract:—

'To all to whom these presents may come by the command of his most excellent Majesty George the Fifth, by the Grace of God, King of the United Kingdom of Great Britain and Ireland and of the British Dominions beyond the Seas, Defender of the Faith, Emperor of India,—I, his Governor-General, do hereby declare and notify the grants, concessions, reliefs and benefactions, which his Imperial Majesty has been graciously pleased to bestow upon this glorious and memorable occasion.

'Humbly and dutifully submissive to his most gracious Majesty's will and pleasure the Government of India have resolved with the approval of his Imperial Majesty's Secretary of State to acknowledge the predominant claims of educational advancement on the resources of the Indian Empire, and have decided in recognition of a very commendable demand to act themselves to making education in India as accessible and wide as possible. With this purpose they propose to devote at once Rs. 50,00,000 to the promotion of truly popular education, and it is the firm intention of the Government to add to the grant

now announced further grants in future years on a generous scale.

* *

A Government resolution has been published that an endowment of Rs. 8,01,000 has been placed at disposal of Their Majesties by Sir Sa J. David, Kt, for agricultural and educational purposes in commemoration of the visit of Their Imperial Majesties.

The press note issued by the Government states the condition of Sir Sassoon David's gift of Rs. 8,01,000. The sum will be administered by a Board of Trustees. The money will be utilised (1) to promote the welfare of the agricultural classes, (2) To assist the building of hostels attached to educational institutions of all classes in the Presidency and (3) if at any time it should appear to the trustees that the money at their disposal cannot be advantageously utilized the Government shall have the power to sanction the dispersion of funds. It is provided that the name of Sir Sassoon David shall be given to the various objects to which money is devoted when they are established.

The Bengal Government has stopped paying a subsidy of three hundred Rupees monthly to the Bengalee weekly called the "Educational Gazette" of Chinsurah (Hooghly). For some thirty years the paper had been receiving a subsidy from the Government ostensibly for helping the spread of education in Bengal. A bookselling firm of Calcutta is still receiving good subsidy monthly from the Government for the same reason.

The Royal
Boon.
Fifty lacs on
Education.

The Education
Gazette
Chinsurah.



CALCUTTA UNIVERSITY

LIST OF EXAMINERS.

The following gentlemen have been appointed examiners for the Matriculation, Intermediate, B. A. and B. Sc. Examinations in 1912.

MATRICULATION.

English—J. N. Das Gupta, Esq. Head Examiner. Examiners:—Messrs. Abinashchandra Basu, Banabilas Ray, Cannon Banerji, Purnachandra Sen, Rakaldas Chatterji, Priyanath Chatterji, Satishchandra Chakraborty, M. L. Pruttam Singh, Debkisor Mukerji, Satyendranath Basu, Miss Victoria Mukherji, Rasamay Mitra, W. R. Le Quesne, Satiskumar Benerji, Banimadhab Ganguli, Gangadhur Banerji, J. N. Mukerji, Mrs. Rajkumari Das, J. N. Thickett, E. J. Thompson, Niranjan Niyogi, Bijoy Krishna Basu, Abinashchandra Mazumdar, Rajanikanto Dutta, Priyanath Nag, Nriyala Mukerji, Prafullachandra Roy, Girindranath Chatterji, Asutosh Chatterji, Padmini Bhushan Rudra, Prabhash Chandra De.

Alternative paper in English—
Rev. R. Gee, M. A.

Sanskrit—Mr. Nrishinhachandra Mukerji, Head Examiner, Kuladiprosad Bhattacharji, Ram Lal Kanjilal, Haricharan Ganguli, Debendranath Ray, Hemchandra Banerji, Rajanikanta Chatterji, Abhibhusan Bhattacharji, Harilal Chatterji, Chandra Chakraborty, Nilmani Chakraborty, Mathuranath Mandal, Harihar Banerji, Juandranath Ray, Janaknath Bhattacharji, Pramathanath Tarkabhusan, Rajendranath Vidyabhusan, Krishnapada Bhattacharji, Kasinath Dass (to look over answer papers written in Uriya character.) Pasupatinath Bhattacharji, Hemchandra Ray, Radhagobinda Basak, Jatindranath Bhattacharji, Kalikrishna Goswami, Surendranath Majumdar, Lakshinarayan Chatterji, Pandit Ram Chandra Vidyabinode.

Pali—Babu Rebatinath Chatterji.

Bengali—(FOR FEMALE CANDIDATES) Rai Sahib Harachandra Rakshit.

Arabic—Maulvi Mahammad Irfan, M. A., Maulvi Mahammad Musa, B. A.

Persian—Shams-ul Ulama Ahmad, Shams-ul Ulama Mirza Ashraf Ali.

Greek—H. Stephen, Esq. M. A., W. C. Wordworth, Esq. M. A.

Latin—R. C. Banerji, Esq. M. A., Rev. R. Gee.

French—Gaston le Fancheur, and Rev. Father Francotte, S. J.

Vernacular Composition - BENGALI. Messrs. Dineshchandra Sen, B. A.—Head Examiner. Ramdas Bhattacharji, M. A., Purnachandra De B. A., Kumudinikanta Ganguli B. A., Debeshchandra Banerji M. A., Bidhubhusan Mukerji, Kshetramohan Sen Gupta, Charu Chandra Basu, M. R. A. S., Jajneswar Banerji, Chandi Charan Banerji, Saratchandra Sastri, Hemchandra Vidyaratna, Haranath Basu, Kali Pada Mukherji, Bidhusekhar Sastri, Sudhindranath Tagore, B. A., Bipinmohan Sen, Hemendraprosad Ghosh, B. A., Induprakash Banerji, Byomkesh Mustaphi, Nabakrishna Bhattacharji.

Hindi—Babu Puranchandra Nahar, M. A., Pandit Bhakurprasad Vyakaranacharyya.

Uriya—Mahamahapadhyay Sadasiv Misra Kabyakantha.

Assamese—Srijut Lakshmikanta Sarma, B. A.

Burmese—Maung We Lin, Esq.

Urdu—Maulvi Mahammad Qasim, Maulvi Hedayat Hossain, Maulvi Mahammad Mustapha Khan, M. A. B. L.

History—Babu Adharchandra Mukerji, M. A., B. L.—Head Examiner. Examiners: Messrs. Atulchandra Sen, M. A., Rakalchandra Basu, B. A., S. K. Ray, Esq. M. A., Haipada Pande, M. A., Binay Kumar Sarkar, M. A. (Bengal National College), Nirodechandra Ray M. A., Subodhchandra Mukerji, M. A., Jogendranath Sinaddar B. A., F. R. Hist. S., Bidhubhusan Sen Gupta, M. A., Syamacharan Mukerji, M. A., Jogendranath Mitra, M. A., Monmohan Basu, M. A., Rampada Majumdar, M. A., Bhuvan Mohan Sen, M. A. To look look over answer papers written in Vernaculars: **Bengali**.—Messrs. Kaliprassana Banerji, B. A. and Manmatho Mohan Basu, M. A.; **Hindi**.—Parmeswarprasad Verma, M. A.; **Uriya**.—Madhusudan Das, B. A.; **Urdu**.—Maulavi M. I. Zarif.

Mathematics Dr. Syamadas Mukerji, Head Exr.

EXAMINERS.—Messrs. Surendramadhab Mullik, M. A., Satishchandra Basu, M. A., Nibaranchandra Das Gupta M. A., Ramendranath Ghosh, M. A., Baikunthachandra Ray, M. A., Surendranath Chatterji, M. A., Nareshchandra Ghosh, M. A., Kaliprasanna Das, B. A., Nagendranath Swarnakar, M. A., Satishchandra Ray, M. A., Lalitmohan Mukerji, M. A., Upendranath Ray, M. A., Bankimdas Banerji, M. A., Syamacharan Basu, B. A., Hemchandra Sen Gupta M. A., Manmathanath Ray, M. A., Satishchandra Datta, M. A., Snahalata Maitra, B. A., J. C. Forrester, M. A., Raghupati Ghatak, M. A., Girijabhusan Mitra, M. A., Kisorimohan Gupta, M. A., Jiban

Mohan Basu, M. A. Sarada Kanta Ganguli, M. A.
Chintaharan Ray, M. A.

Geography—Birajmohan Majumdar, M. A. B. L.
—Head Examiner. Examiners.—Hemchandra
Das Gupta, M. A. Purnachandra Bhattacharji, M. A.
Nibarachandra Ray, M. A. Manorathadhar
De, M. A. Radhikamohan Chaudhuri, M. A.
Gangadhar Mukerji, M. A. Kaliprasanna Sen Gupta,
M. A. Hari Das Shaha, M. A.

Elementary Mechanics.—W. H. Everett
Esq., B. A., B. E., M. I. E. E.

INTERMEDIATE EXAMINATIONS IN ARTS AND SCIENCE, 1912

English.—Heramba Chandra Maitra, M. A.
Head Examiner. Examiners.—Messrs Hem
Chandra Sarkar, M. A. Lalumohan Chatterji, M. A.
Jaygopal Banerji, M. A. Gopal Chandra Maitra, M. A.
A. Mauchline, M. A. B. D. Satschandra Mukerji, M. A.
Bijaygopal Mukerji, M. A. Prafullachandra Ghosh,
Gopalchandra Ganguli, M. A. Amulvadhan Banerji,
M. A. Suis Chandra De, M. A. Bausan Chandra Das,
M. A. Nirmalabala Sen, M. A. C. Linton, M. A.
A. Warren, B. A. Haendra Kumar Mukerji, M. A.
Rajanikanta Guha, M. A. Narendranath Ray, M. A.
Surendranath Bhadra, M. A. J. Holme, Esq., M. A.
R. N. Gilchrist, Esq., M. A. F. H. Robinson, M. A.
E. A. Hornell Esq., M. A. J. Barrow, Esq., M. A.
Dr. Jajneswar Ghosh, M. A. Ph. D. W. S. Page, M. A.
Maulai Chatterjee, M. A. Nikhilnath Maitra, M. A.
W. V. Duke, B. A., A. Cameron, M. A., C. McWil-
liam, M. A. B. D. Charu Chandra Biswas, M. A.
Jatindrachandra Guha, M. A. Sureschandra Ray,
M. A. Ashutosh Mitra, M. A. Annadaprasad Bhatta-
charyya, M. A.

Alternative Paper in English—Egerton
Smith Esq., M. A.

Sanskrit—Mahamahopadhyay Kaliprasanna
Bhattacharyya, —Head Examiner.

Examiners.—Saratchandra Gupta, M. A., Kokiles-
war Bhattacharyya, M. A., Abinashchandra Guha,
Bharital Banerji, M. A., Debendrakumar Banerji,
Surendranath Bhattacharyya, M. A., Banamali Cha-
krabarti, M. A., Satkari Adhikari, M. A., Biswanath
Sastri (to look over answer papers written in Deb-
nagiri), Kumudbhanda Chatterji, M. A., Jogendra
nath Bhattacharyya, M. A.

BENGALI (for Female candidates,) Dineshchandra
Sen B. A., Jogindranath Basu B. A.

Pali—C. Duroiselle, Esq., Rabinath Chat-
terji, M. A.

Arabic—Shams-ul Ulama Kamaludin Ah-
mad, M. A., Shams-ul-Ulama Abu Nasr Muham-
mad Waheed, M. A.

Persian—Shams-ul-Ulama Mirza Ashraf Ali,
Maulvi Khalil Ahmad, M. A.

Latin—R. C. Bannerjee, Esq., M. A., Rev E. J.
Thomson B. A.

French—Rev Father E. Francotte, S. J. Gaston
Le Fancheur, Esq.

Vernacular Composition : Bengali—
Mahamahopadhyay Dr. Satschandra Acharyya
Vidyabhushan, M. A., Ph. D.—Head Examiner.
Examiners.—Abinashchandra Das, M. A.,
Jogeshchandra Roy, M. A., Girendrakumar Sen,
M. A., Gobindanath Guha, M. A., Kishirodprosad
Vidyabinod, M. A., Norendranath Bhattacharyya,
B. A., Chandrasekhar Sen, Panchanan Ghosal, M. A.,
Satschandra Mitra, B. A., Jagadananda Ray.

Hindi. Babu Baidyanath Narayan Singha,
M. A. B. L.

Uriya. Babu Kasinath Das, M. A.

Assamese. Srijiit Nabinchandra Bardolai, B. A.

Burmese. C. Duroiselle, Esq.

Urdu. Maulavi Gulam Yazdani, M. A.
Maulavi Muhammad Mustapha Khan M. A. B. L.

History. Babu Bipinbhabari Sen, M. A., Head
Examiner. Examiners. Akshaykumar Sarkar, M. A.
Dharmadas Banerjee, M. A. Santosh Chatterjee,
M. A. Upendranath Ghoshal, M. A. Debendranath
Sen, M. A. Binaykumar Sen, Esq. (Chittagong).
N. K. Nag, Esq., B. A. (Cantab). Pramathanath
Banerji, M. A. Bejoychandra Sen-Gupta, M. A.
Aswini Kumar Mookerji, M. A. Krishnadhan
Banerji, M. A. Nisikanta Sanyal, M. A. J. C.
Kydd, Esq., M. A. N. N. Gupta, Esq., M. A.

Logic. H. Stepher, Esq., M. A., Head Examiner.
Examiners. Birchandra Sinha, M. A. Ambika-
chandan Mitra, M. A. Chintaharan Chakrabarti, M. A.,
Sasibhushan Basu, M. A. Khagendranath Mitra
M. A., Khudiram Basu, B. A., Hemchandra De,
M. A., Praphullakumar Chakrabarti, Esq., M. A.,
C. Schelle, S. J., Mahendranath Sarkar, M. A.,
Svamacharan Chakrabarti, M. A., Upendranath
Gupta, M. A., Surendralal Kundu, M. A., Sitaram
Banerjee, M. A.

Mathematics. Gaurisankar De, M. A. Head
Examiner. Examiners. Rajanikanta Barat, M. A.,
Anathnath Palit, M. A., Sardaprasanna Das, M. A.,
Racharan Biswas, M. A., Asutosh Chatterjee, M. A.
Baidyanath Basu, M. A., Kshetramohan Banerjee,
M. A., Kaliprasanna Chatteraj, M. A., Haridas
Bagchi, M. A., Harilal Chaudhuri, M. A., Upendra-
narayan Sinha, M. A., B. C. Ghosh, Esq., M. A.

Physics. Ramendrasundar Trivedi, M. A., Head
Examiner. Examiners: Hridaychandra Banerjee,
M. A. Purnachandra Kundu, M. A. Tarapada Mukerjee,
M. A., Tulsideas Kar, M. A., Bamacharn Bhatta-
charyya, M. A., Hemchandra Sanyal, M. A.,
Mohinimohan Ray, M. A., Surendranath Ghosh,
M. A., O. B. Meek, Esq., M. A. J. A. Taylor,
Esq., M. Sc., Saradamohan Bhattacharyya, M. A.,
Saratchandra Majumdar, M. A.

Chemistry. Rai Chunilal Basu, Bahadur, M. B.
F. C. S., Head Examiner. Examiners: B. C.
Dutt, Esq., M. A., Bidhubhushan Datta, M. A.
Kiranachandra Mitra, M. A. Atulchandra Ganguli,
B. A. Chunilal De, M. A., K. G. Nayak, Esq.,

B. Sc., M. A. Gopibhushan Sen, Dhirendranath Mukerjee, M. A. Asutosh Maitra, M. A. Panchanan Niyogi, M. A. Kalidas Mallick, M. A. Anukul Chandra Sarkar, M. A. Kshutis Chandra Roy, B. Sc. Dwijadas Dutta, B. Sc., M. S. A. J. F. Martyn, M. A. B. Sc. B. K. Singh, B. A. (Camb.)

Geography. W. G. Brockway, B. A., Hemchandra Das-Gupta, M. A.

Physiology Satischandra Banerjee, L. M. S. Nibaran Chandra Bhattacharya, M. A. B. Sc.

Botany. Girindranath Mukherjee, B. A. M. D. Ekendranath Ghose, L. M. S., B. Sc.

Wordsworth, Esq. M. A. J. C. Coyajee, Esq. M. A. Honours. Manohar Lal, Esq. M. A. C. Russel, Esq. M. A. T. T. Williams, Esq., B. A. B. Sc.

Mental and Moral Philosophy. Pass.

Rev. W. S. Uiquhart, M. A. Dr. Adityanath Mukerjee, M. A. Ph. D. Babu Krisnachandra Bhattacharya, M. A.

Honours. G. T. R. Rose, J. R. Banerjee, Esq. Dr. Hiralal Haldar.

B. A. EXAMINATION—1911

English. Pass. Father J. Power, S. J., J. A. Murray, M. A., J. S. Zemin, Esq. F. Turner, Esq. M. A., T. S. Sterling, Esq., M. A. Jyotishchandra Banerjee M. A.

Honours. A. D. Keith Esq., M. A. Father E. O. Neil, S. J. Lalitkumar Banerjee, Esq. M. A.

Alternative Paper in English. E. M. Wheeler M. A.

Sanskrit. Pass: Brajajal Chakrabarti M. A., Muralidhar Banerjee M. A., Bhagabatkumar Goswami Sastri M. A.

Honours Pandeya Ramavatara Sarma Sahitya charyya M. A., Rajendrachandra Sastri Bahadur M. A., Umacharan Banerjee M. A.

Pali. G. Thibaut C. I. E., Ph. D., D. Sc., Mahamahopadhyay Satischandra Acharya, Vidyabhushan M. A., Ph. D. Rebatinath Chatterjee M. A.

Arabic (Pass and Honours.) E. D. Ross Ph. D., Shamsul Ulama Kamaluddin Ahmad, Shamsul Ulama Abu Nasr Mahammed Waheed M. A.

Persian. (Pass and Honours.) D. C. Phillott M. A., Maulvi Mohammad Karim Shirazi, Shamsul Ulama Ahmed.

Latin—Rev. R. Gee, M. A. W. C. Wordsworth, Esq. M. A., Rev. E. J. Thompson, B. A.

French—Dr. G. Thibaut, C. I. E., Ph. D., D. Sc., Dr. E. D. Ross, Ph. D., Rev. Father E. Francotte, S. J.

Vernacular Composition. Bengali—Pandit Tarakumar Kabiratna Head Examiner, Akshaychandra Sarkar B. A., Kshirodchandra Raychaudhuri M. A., Kokileswar Bhattacharyya M. A., Jogendranath Basu B. A.

Hindi—Pandeya Ramavatara Sarma Sahitya charyya M. A.

Urdu Kasinath Das M. A.

Assamese Hemchandra Goswami.

Burmese. C. Duroiselle Esq.

Urdu. Shamsul Ulama Ahmad

History. Pass: Binavendranath Sen M. A., R. B. Ramsotham Esq. M. A., E. F. Oaten Esq. M. A.

Honours. W. Owston Smith, Esq. M. A. M. N. Bose, Esq. M. A. Jadunath Sarkar, M. A.

Political Economy and Political Philosophy. Pass. Manohar Lal, Esq., M. A. W. C.

B. A. and B. Sc. EXAMINATIONS—1911.

Mathematics. Pass. Babu Indubhusan Brahmachari, Babu Kalipada Basu, R. W. F. Shaw, Esq.

Honours. Dr. Ganesh Prosad, Babu Krishna prasad De J. Bottomley, Esq.

Physics Theoretical. Pass. Rai Kumudini-kanta Buerjee, Bahadur, M. A. Babu Jnanchandra Ghosh, M. A.

Honours. C. Russell, Esq. M. A. E. P. Harrison, Esq. Ph. D. A. Macdonald, Esq. M. A. B. Sc. Saratkumar Dutt, Esq., M. A.

Practical. Pass and Honours. C. W. Peake Esq. M. A. Chairman Board of Examiners in Practical Physics.

“Presidency College Centre.”

W. H. Everett Esq. E. P. Harrison, Esq.

“Scottish Churches College Centre”

Babu Juan Chandra Guosh and S. K. Dutt, Esq. M. A.

“St. Xavier’s College Centre.”

P. Bruhl, Esq. and Rev. Father Roeland.

“Dacca Centre”

A. Macdonald, Esq.

Chemistry Theoretical. Pass. Babu Jyotibhusan Bhaduri, M. A. Babu Jyotindra Nath Sen, M. A.

Honours. Dr. P. C. Ray, D. Sc., Ph. D., F. C. S. Dr. K. S. Caldwell, Ph. D. Dr. D. Thompson, Esq. M. A. B. Sc. Ph. D. B. N. Das, Esq. M. A. B. Sc.

Practical.—Pass and Honours—W. Tate, Esq. F. C. S., A. K. C. S., Chairman, Board of Examiners in Practical Chemistry. Presidency College Centre.—W. Tate Esq., F. C. S., A. K. C. S. Babu Jyotibhusan Bhaduri, M. A. Scottish Churches College Centre.—Rev. J. Watt M. A. Babu Chandra Bhushan Bhaduri, B. A.—St. Xavier’s College Centre.—Rev. Father E. Francotte S. J. Dr. W. A. K. Christie B. Sc. Ph. D. Dacca Centre.—E. R. Watson, Esq. M. A. B. Sc. Dr. D. Thomson, M. A. B. Sc. Rangoon Centre.—M. Hunter, Esq. M. A.

Physiology—Major D. Mc Cay, M. B., F. R. S., Dr. Upendranath Brahmachari M. A., M. D. Ph. D. S. C. Mahalanobis Esq. B. Sc. F. R. S. E.

Botany.—I. H. Burkill, Esq. M. A. F. L. S. P. Bruhl, Esq. M. B. F. C. S., F. G. S. S. C. Mahalanobis Esq. B. Sc. F. R. S. E.

Geology—H. H. Hayden, Esq. B.A., B.E., F.G.S.
G. H. Tipper, Esq. M.A., B.E., F.G.S. W. F. Bion,
Esq.

PUNJAB UNIVERSITY.

A proposal was made to increase the term of Medical Study (for the course of M. B., B. S.) from four years to five. Several members opposed the proposal while others heartily supported it. A neutral course was suggested by Mr. S. K. Dutta, B.A., M.B., B.Ch., of the Forman Christian College which was much appreciated. No final settlement has as yet been made.

A Subcommittee of the University Senate has proposed to send Dr. J. C. R. Ewing D. D., LL. D. Principal Foreman Christian College and Vice-Chancellor, Punjab University as representative of the Punjab University to the coming Congress of the Universities of the Empire to be held in London. Besides, Mr. Woolner, who will be in London at that time will also join the Congress as a delegate from the Punjab University.

The syndicate has omitted 'Where three Empires Meet' by R. F. Knight from the B.A. English Courses of the University for 1912-13 in response to the representation of the Kashmir Students of the Punjab.

The syndicate of the Punjab University has decided to make an application to the Government for a grant of Rs. 16,500 for constructing an astronomical Laboratory at Lahore that shall be open to all affiliated Colleges of the University. The building is to be erected on the corner of the Chanburji ground and will consist of (1) a room 25 ft long by 20 ft broad with a slit in the room 3 ft wide (2) a dome for dome for the Equatorial requiring an additional plot of ground 10 ft long.

ALLAHABAD UNIVERSITY.

His Honor The Chancellor has been pleased to nominate the gentlemen named below as Fellows of the Allahabad University :—Major J. H. Walton, I. M. S. Civil Surgeon, Saharanpur the Hon. Sir George Knox, Kt, the Hon. Dr. Sundar Lal C. I. E. Sir Alexander McRobert, Kt, Rai Bahadur Munshi Gokul Prasad, Pandit Suraj Prakash Saheb, Babu Abhaya Charan Sanyal and Messrs. J. Murray and T. C. Jones.



AND SCHOOLS.

The annual prize giving at St. Xavier's College Calcutta, came off on Thursday evening under the presidency of the Hon. M. Justice Carnduff and in the presence of a large gathering of ladies and gentlemen. The programme presented was very interesting, one of the items being the dramatic representation of "The Mock Duke of Burgundy."

The report submitted by Father E. O'Neill, S. J., Rector, shewed that the College had 715 boys on the rolls. Of these 410 belonged to the School Department and 305 followed the University courses of the College. There were 94 boarders. Candidates were sent up for the first time for the Junior and Senior Cambridge examinations. For Junior examination, six were sent up and all passed. Of nine boys presented for the Senior Cambridge examination, five passed, four of them securing School Certificates and two taking Honours. In the examinations of the Calcutta University, twenty-seven of the students passed the Intermediate Arts examination. Five qualified for the B.Sc. degree, two with Honours in Chemistry and one with distinction. The Cadet Corps was 180 strong with two officers. The Company was under-officered; the prejudice of Head-Quarters to the appointment of boy Lieutenants has yet to be overcome. Captain Meade, in command of the College Corps in spite of the shortage of officers, brought his Company up to a high state of efficiency.

This was followed by the distribution of prizes which consisted of medals and beautiful books.

The President next delivered a neat little speech advising the students, after which with a hearty vote of thanks to the chair the ceremony came to a close.

A correspondent writes.—The Zamorin's College was en-fete on Friday. The students of the College invited Mr. T. R. Rama Chandra Iyer, the well-known Vakil of Madras, to deliver an address. The address it need hardly be said, was lucid and highly instructive.

Zamorin's
College
Calcutta

tive, and was listened to with rapt attention. Mr. Raja Rama Iyer, the Principal, proposed a vote of thanks to Rama Chandra Iyer at the close of the lecture and in doing so exhorted the students to take a lesson from Mr. Rama Chandra Iyer. The learned Sanskrit Pandit of the College composed an extempore poem thanking Mr. Iyer for the visit. Mr. Rama Chandra Iyer proceeded to Madras by the night train on Friday.

The Annual celebration of the Government College Graduates Union was held on Saturday, the 25th Nov. in the Evening. Many old boys including some distinguished alumni partook of the party and the evening was spent quite jollily in amusements and tennis playing. The College students gave in honour of the old boys an Under play, called the Said-i-Hawais, for three days consecutively. The function was most charming from head to foot.

The Government College Economical Society held a meeting on the 27th Nov with Prof. G. A. Wathen M. A. of the College, in the chair.

Dr. G. L. Bata and Kul Bhusan are delivering lectures on Hygiene and first aid to the Injured under the auspices of the S. P. S. K. every Friday and Wednesday respectively. The lecturers attract a number of students from all the colleges, and are made more interesting with occasional lime light Demonstrations.

Raja Sir Harnam Singh Ahluwalia K. C. I. E. has been appointed a Trustee of the College Committee in place of Charles Golaknath Esq. deceased.

At a recent meeting of the Law Faculty of the Punjab University held in the chamber of Sir Arthur Reid, Chief Justice, it was decided to recommend Mr. Kunwar-sain, M. A., Barrister-at-law, to the Syndicate for the post of Principal of the University Law College.

About Rs. 30,000 were collected in response to Principal Hansraj's appeal for funds of the Dayanand Anglo-Vedic College at the Arya Samaj anniversary. The response to the Waccharali or gurukula section of the Samaj was somewhat larger, Rs. 40,000 being collected in cash and promises, besides landed property, to a total value of about Rs. 60,000 which were donated by the gentlemen.

Professor N. K. Roy, B. A., F. R. S. L., Senior Professor of English Literature and history of Maharaja's College Jaipur, has been appointed as the Head Master of Khurja High School. He has been working here for the last fifteen years and has an experience of teaching of over 22 years. The college shall lose in him one of her best professors. Great preparations are going to be made in connection with his departure.

On Monday, the 27th November, a congratulatory address was presented to Dr. A. Venis, Principal of the Queen's College, Benares, on behalf of the institution. There was a fairly large gathering in the College Hall when the address was read by a senior student. Dr. Venis replied in a short speech in which he referred to a very old boy of the College, perhaps the oldest there, Raja Madho Lal, C. S. I. who, he said, had witnessed the ceremony of laying the foundation stone of the College and its opening. It may be mentioned that it is no less a matter of congratulation that Dr. Venis himself, an old boy of the College, was at the head of the institution.



The Government of the United Provinces is prepared to receive applications for technical scholarships of £150 a year, each tenable for two years, enabling the holders to proceed to England or any other western country in order to obtain instruction in one of the following industries—(i) mechanical engineering, (ii) electrical engineering, (iii) manufacture of paper. The possession of a University degree is not required, but candidates must possess a thorough knowledge of English and must be qualified either by a scientific education or practical

Technical
Scholarship
for the U. P.

cal experience to profit by one or other of the courses of study which has been indicated. It is desirable further that they they should already have some connection with the industry or should be in a position to turn their training to practical use on their return to this country. Applications giving full details of qualifications and antecedents should reach the Secretary to Government, Industries Department, Allahabad, not later than the 1st March, 1912. The applicants should state which industry they select and what their qualifications are specifically in respect of the industry selected. 'Candidates must clearly understand that they will have to depend upon their own exertions when they return to India and that the Government does not and cannot undertake to provide them with employment

The famous Davar's College of Commerce with which our readers are no doubt aware will start its new Session on the 8th January 1912, the youngmen, ambitious of entering upon a successful Commercial career would do well to write to Prof. Davar for a copy of the latest Prospectus of this College which is the Premier College of Commerce in India, recognised by the Government and the various Ruling Princes of India such as the H. H. Maharajas of Mysore, Baroda, Gwalior, Bhopal etc. The College is fitted up on up-to-date lines with electric fans and lights, and contains all the furniture and cabinets and impliments for teaching practical Commerce. Prof. Davar has worked for fifteen years as a Commercial Educationist, visiting Europe seven times and the perfect condition and the high reputation which the College enjoys is the result of his strenuous work of these years. The passes for this year were one hundred and eighty, which included two silver medals granted by the Examinations Board of the Central Association of Accounts of London and fifteen "Distinctions". Three thousand students have been up to this time trained out of this College, who are now holding various appointments in Bombay and Madras Presidencies, also in Punjab and United Provinces.

OTHER EDUCATIONAL ADVANCES.

The following telegrams have been exchanged between the Aga Khan and the Maharajah Bahadur of Durbhanga:—"Permit me to congratulate you and the Hindu sister community on the success of your University. Please accept the humble donation of Rs 5,000 for a Hindu University. Wish it success—Aga Khan."

"In the name of the Hindu community I thank Your Highness for the generous donation which you have been pleased to announce and I hope to return the compliment when I have the good fortune of visiting Aligarh by asking Your Highness and the Mahomedan community to accept Rs 20,000 as my humble contribution to the cause of Mahomedan education. Let us both Hindus and Mahomedans pray to God that we remain united with each other, steadfast in our loyalty to our gracious Sovereign, and while ever zealous in the cause of education, ever faithful to the respective creeds of our great ancestors. Maharajah Durbhanga."

The following telegram from H. H. the Aga Khan has been received by the Maharaja of Darbhanga:—"I most sincerely and gratefully thank you for your generous donation. My greatest ambition is to see Hindus and Moslems love each other and each help the faith of the other—Aga Khan."

The Hindu University deputation headed by the Maharaja of Darbhanga waited upon the Hon.

Mr. Butler at the Town Hall, on Monday morning, when the details of the draft Hindu University Bill were placed before him and informally discussed. The Education Member was sympathetic throughout and ordered that he would place the whole question before His Excellency the Viceroy and the Government of India as soon as possible.

The Sectarian Universities,
The Aga Khan
and the
Maharaja of
Darbhanga.

Davar's
College of
Commerce

The Hindu
University
Deputation

At the Mahomedan Education Conference on the 4th inst, the Hon. Syed Ali Imam and the

Mahomedan
Education
Conference.
Delhi, 4th
Dec. 1911

Maharaja of Durbhanga attended. The Nawab Vikar-ul-Mulk Bahadur, the Hony. Secretary of the Conference and of the Aligarh Trustees moved the

following resolution.—“This Conference expresses with great earnestness and real enthusiasm its grateful thanks to the Government of India which is the representative of His Imperial Majesty for its gracious kindness and great sagacity which will soon make it possible for the Mussalmans to realise their long cherished ideal of a Moslem University and on behalf of the whole community this Conference thanks the Hon. Mr. Butler for his kind assistance in securing a most sympathetic consideration from the Supreme Government for the united wishes of the Moslems in this behalf.”

The Hon. Sahebzada Aftab Ahmed Khan seconded the resolution.

The Hon. Mr. Butler who spoke in Urdu acknowledged his thanks for the resolution. He said what he had done was only his duty but added that in view of his early associations with Sir Syed Ahmed Khan, Mr. Justice Mahmud and Nawab Mohsin-ul-Mulk and his friendly relations with Nawab Vikar-ul-Mulk and the Hon. Mr. Aftab Khan, it was also a pleasure to do what he had done. He announced that he was hopeful that both Moslems and the Hindus would get their Universities if only they collected sufficient sums of money. It was now mainly a question of funds and he urged the Musalmans to pay up what they had promised and to subscribe afresh. He referred to the donations of H. H. the Aga Khan to the Hindu University, of the Maharaja of Durbhanga to the Moslem University and said that nobody would rejoice at the existence of such relations between these two communities more than the Government itself. He thought it a good omen that such relations should appear at this memorable time when all were uniting to welcome His Most Gracious Majesty.

The Hon. Raja of Mahamudabad thanked Messrs. Butler, Ali Imam and the Maharaja of Darbhanga for gracing the Conference with their

presence. A resolution to that effect was passed by the Conference. The Maharaja of Darbhanga in offering his acknowledgments hoped that the sister movements of Hindu and Moslem Universities would soon put an end to Godless education.

H. H. the Nizam has donated 5 lacs of rupees towards the funds of the proposed Muslim University.

We learn from the report of the National Council of Education, Bengal, that the most noticeable benefaction received last year was a donation of Rs. 30,000 which Babus Radha Kumud Mukerji and Benoy Kumar Sarkar, both Professors in the Bengal National College, were instrumental in placing at the disposal of the Council. ‘This handsome donation enabled the Council to carry out one of its objects by sending seven students who had studied or worked under the Council for completing their education in America.’ Seven students were accordingly sent to America and as our readers know, they have been rendering an excellent account of themselves.



Mr. Andrew Carnegie, who is in his 78th year, has given a further donation of £5,000,000

in pursuance of his policy that ‘It is a crime to die rich.’ It is estimated that

Mr. Carnegie
Benefactor

Mr. Carnegie has now made donations in various directions totalling £44,160,000 of which the largest item is £10,500,000 expended for the foundation of libraries. It is

interesting to note that Mr. Rockefeller's gifts amount to some nine millions less than those of the steel magnate, totalling £34,912,000. Between them they have made donations amounting roughly to £79,000,000.

The second Moral Education Congress is announced to take place at The Hague towards the end of August in next year. We sincerely trust it will prove no less successful in informing and guiding public opinion than the first Congress which was held at the University of London in 1908. The term "moral education" covers a multitude of ideas, and many persons are inclined to read the phrase in its narrower sense. In the view of the promoters of the Congress the words mean "formation of character." We always talk as if the first business of our schools was formation of character. But when we are asked what steps are taken to compass the desired end, or what method or system is followed, we are driven back on such generalities as refer to the soundness of school life, the prevailing uprightness of teachers and the like. We want to be made to think out our position on this point. To promote clear thinking is the purpose that the Congress sets itself. What is meant by formation of character, why is it important, how shall it be promoted—these are the problems to which the Congress hopes to contribute a solution.

The appointment of Prof. Sadler as Vice-Chancellor of the University of Leeds brings distinction to that town. Dr. Sadler is an able organizer and exercises a stimulative influence on every one with whom he comes in contact. But he is more than this. He is a man of ideas; a man with imagination. We live in what is called a practical age, and we like to call ourselves a practical people; but, after all, practical people are those who plod steadily along the path that has been discovered by the men of imagination. Ideas give the real vivifying force. Ideas are the mainspring of action. This is why Prof. Sadler has exercised

so deep and wide an influence over educational thought for the last fifteen years. We rejoice to think that as Vice-Chancellor of the University of Leeds he will still be a leader in educational politics. Never did Sir William Anson do a greater public service than when, by insisting that Mr. Sadler's duty was to "devil" for the Department, he compelled him to resign. Admirable as his work was as a Special Inquirer, he might have given up to Whitehall what was meant for the nation.—*Journal of Education*.

The announcement of the coming Scholarships and Exhibitions Examinations appears as usual in the first *Gazette* of the term; but Oxford men of the olden time would be surprised at the range of subjects which to-day appear in the list. There are no less than *nine* different studies for which scholarships or exhibitions are offered. These are as follows:—Classics offered at nineteen colleges, Mathematics at thirteen, Natural Science at eleven, History at fourteen, English, Modern Languages, Hebrew, Divinity and Hebrew, Music, each at one college. More than half these subjects have been added to the list in quite recent years, and would probably cause doubt and misgiving in some Oxford men of the olden time. But few who have followed recent changes would fail to see the great advantage of the encouragement thus given to a wider range of studies.

An interim report of the School of Oriental Languages for 1910 is published. The Committee is unanimous in the opinion that in view not only of the academic but also of the commercial needs, the school is intended to supply, it would be difficult to find a better site than the London Institution. The committee understand that Lord Haldane at the request of Lord Morley when the latter was Secretary of State entered into communication with the managers of the institution with regard to the utilization of existing buildings with certain alterations costing from £2,000 to £25,000 to provide for convenient and satisfactory

The Moral
Education
Congress

Oxford
Scholarship
Examinations

Vice-Chancellor
of Leeds

Location of
the school of
Oriental
Languages
London

accommodation at the outset. The Committee says streets on the statement that the value of the site cannot be less than £100,000. It further estimates the annual domestic expenditure of the school, if placed in the London Institution at £4,000. This is naturally apart from the salaries of the Director and teaching staff estimated by Lord Reay's Committee at £10,000. Regarding the constitution of the Committee, for the present, the report merely expresses the opinion that a school should be established under Royal Charter.

The seven Swiss Universities (Lausanne, Geneva, Fribourg, Neuchatel, Berne, Zurich, Basle) have between them 8120 students. Of these 3672 are foreigners and 1161 women.

We are glad to insert the following note regarding some students of the National Council of Education, Bengal—Mr. E. H. Wells, Acting Dean of Harvard College U. S. A. writes to Dr.

Rashbehari Ghosh, President of the National Council of Education, Bengal:—"It gives me great pleasure to send you a word of congratulation on the academic record of the following students who have studied at Harvard during the past year, namely, J. N. Set, H. L. Roy, N. N. Sen Gupta, and B. K. Sarkar. The records of Set, Roy and Sen Gupta places them in the second group of scholars, an admirable performance when one considers their age and the natural difficulties of the language and different customs. Hoping that these young men are only the advance guard of other Hindu students of similar high quality, I remain, sincerely yours, (Sd.) E. H. Wells."

Mr. T. C. Jayaratnam, son of Mr. T. S. Cooke one of the most popular Proctors of Jaffna Ceylon and grandson of Mr. T. M. Tampoe J. P. retired Police Magistrate of Jaffna, has won the Government University Scholarship of £200 per annum tenable for four years for education in England, upon the result of the recent Inter-Science Examination of the London University, appearing from the Royal College, Colombo. Young Mr.

Jayarathnam had all along shown brilliant parts, and the educational world in Ceylon was expecting him to carry off the coveted prize this year. He passed the Junior Local in the 1st class a few years ago from the Jaffna Central College, with four distinctions, under the tuition of the indefatigable Professor W. R. Cooke and Rev. W. M. P. Wilkes and other teachers. Thereafter he proceeded to the Royal College, from where he passed the Cambridge Senior Local in the 1st class with two distinctions, and taking up that examination once more he won the Ceylon Mathematical Prize. He was the first in Ceylon to go in for the London Inter Science while only 17 years of age, His brilliant success is therefore one upon which all Jaffna is proud, and we heartily congratulate him on it. We wish him a bright career in the future and have not the least doubt that he will win fresh laurels and will not only shed lustre on, but prove highly useful to, his community, which is justly proud of him.

Under the patronage of his Highness the Thakore Saheb of Morvi, three students from the High School of that State have been sent to England lately for the purpose of receiving higher education in England. These three students are Messrs. Niran Bhanji, Manubha Kalubha and Malji Gokal, who are all promising youths.

The following Indians were called to the Bar:—

Lincoln's Inn.—Mahk Ali Asghar; Jai Deva; Nripendra Nath Bhose, Downing Coll., Camb.; Nayanmohan Chatterjee; Maundranath Kanjilal, Downing Coll., Camb.; Nazir-ul-Haq Ghazi, Edinburgh Univ.; Nirmal Chandra Banerjee.

Inner Temple.—M. Narasimham, Oxford.

Middle Temple.—Syed Mohammed Cassim. Manmohan Nath Chak, Diwan Khem Chand, Mirza Mohamed Shakir Hussain, Vanga Jagannadha Row, Mahomed Abdur Rashid, Guan Chandra Varma, Jamini Mohan Banerjee, Nam Sukh, Shah Mohammed Zubair, Mohamed Daud, Sarjoo Prasad, Syed Abdul Bari.

Gray's Inn.—Narain Singh, Ali Mohamed Shah.

Sir H. Thirkell White presided at the annual meeting of the Burma Society, at the club rooms Charlevile-road, West Kensington.

Burmese Students in England The report stated that the grant of £150 per annum made by the Secretary of State in council and his sanction of an initial grant of £400 by the Government of Burma for furnishing had enabled the society to have club quarters of its own. The Secretary of state agreed to increase the subvention to a *maximum* of £200 a year when the society could guarantee an income of £150 from other sources. By July the full subvention was obtained. The club had been greatly appreciated, and it was hoped that a more ample institution would be provided in the future. In accordance with a desire expressed by the young Burman members that they should bear a fuller share of the financial responsibility, the subscription was to be raised from 10s. to a guinea. The Chairman said the society had a right to look for increased financial support from the Province of Burma, which had sent contributions amounting to £100 during the year. He wished to remove a misapprehension which might have had some effect in limiting the help given by English sympathizers. It was not the intention of the society to encourage young Burmans to come to England in large numbers and without discrimination. But to all Burmans of character and standing who came to England the society offered a warm welcome, provided opportunities for social intercourses, and afforded where necessary, guidance and encouragement.

CARLYLE—A STUDY.

The first impression produced on the mind of the reader of Carlyle is that his *style* is new and apparently lawless. As Taine says "All is new here—ideas, style, tone, the shape of the phrases, and the very vocabulary." He displays greater freedom than the Romantic School of English literature. He refuses to be fettered by the conventional rules of literary style, just as he refuses to be in harmony with the dominant tendencies of his age.

He quickly passes from one extreme to another—from glewing poetry and pathos to the grotesque and the ludicrous. And yet there is an irresistible charm about his style. He makes us *see* things as real. As we read his History of the French Revolution we see the events happening before our eyes. His intense passion operating on a powerful intellect enables him to reproduce an individual or scene in a life-like manner, with wonderful force and remarkable vividness.

Carlyle's *destructive criticism* has been so conspicuous that one is apt to overlook his firm hold on practical realities. In the *Latter-day Pamphlets*, for example, model prisons, schools for the reform of criminals, poor-laws, churches, as constituted in modern times, the aristocracy, parliament &c. are most violently and mercilessly attacked and ridiculed. A prominent feature of his character and style is this cynical contempt for and abuse of modern institutions. And yet, as Taine points out, dowered with the positive spirit and the sense of the sublime he turns out a successful historian and a religious philosopher—dealing with and interpreting real things.

His *method* is the intuitive method of a genius. He does not prove, but affirms what appears to his mind selfevident. This is the reason why he is so frequently called a seers or prophet.

His *great work* has been the interpretation of German thought to the English. To introduce German thought into England was difficult owing to the strength of the positive spirit in the English people. But at the same time it must be admitted that the positive spirit must lead to generalisation and theory to be intellectually productive and hence the predominance of the positive spirit could not be a bar for ever to the introduction of the speculative spirit of Germany. His *philosophy* is a sort of poetic phenomenism based upon the phenomenism of Kant, but rendered more sceptical by the adoption of Fichte's views, and approaching (in his more speculative moods) the dogmatic pantheism of Goethe and Schelling. The noumenal world of transcendental realities (or strictly speaking reality) lying beyond the phenomenal—the mysterious Power or Spirit or "the Divine

Idea of the world" *clothes* itself as it were with the world of appearance, so that sensible Nature is as it were "the living garment" of the Deity. The phenomenal world has only a phantasmal existence. This is Carlyle's creed. The conception of Nature as the phenomenal reflection of an unknown Reality is explained in *Sartor Resartus* which, notwithstanding its most grotesque or humorous form, is Carlyle's finest philosophical work. To him *morality* has an active import. The good man is not merely the passive blameless man but the man of action who works to realise the Divine Idea on this earth which finds its highest human realisation in the Hero. A man's religion, according to him, is what he practically believes and knows for certain concerning his vital relations to this mysterious Universe and his duty and destiny there. It may be scepticism as people usually style it—it may be 'no-religion' according to the usual way of thinking—still it is his religion. Every religion, Carlyle thinks, expresses a certain amount of truth. At the same time he does not put all religions on the same level. He speaks of "far higher and truer religions" than Paganism and admits the pre-eminence of Christianity among religions by saying "Hero-worship, heart felt prostrate admiration...for a noblest god-like Form of Man—is not that the germ of Christianity itself? The greatest of all Heroes is One—whom we do not name here! Let sacred silence meditate that sacred matter; you will find it the ultimate perfection of a principle extant throughout man's whole history on earth."

With regard to *literary criticism* we may note that Carlyle's view is that the poet, the artist, the man of letters being an interpreter of the Divine Idea of the world, the beauty of a poem or work of art lies in the truth which shines through it and a literary man's merits are to be judged by the amount of truth he teaches men to illuminate their understanding and reform their lives. Hence he ignores the value of form as a source of beauty.

He identifies the *history* of mankind with that of greatmen or heroes. His theory of history and of heroes is only an application of the Hegelian notion of the dominant "Idea" of every nation, period

and civilisation. According to this view the history of a nation is an organic process in which the dominant *Idea* evolves and embodies itself. "The Hero represents the civilisation in which he is comprised; he has discovered, proclaimed or practised an original conception, and in this his age has followed him." A historian will always best represent those characters and periods with which he has greatest sympathy and hence Carlyle is the best exponent of the period of his own spiritual progenitors—the Puritans. This does not mean that he accepted all the theological dogmas of his ancestors, but simply that the fundamental idea or feeling from which their dogmas flowed was also the fundamental inspiring idea and feeling of his own, viz. the idea of good and evil or of righteousness in general, particularly in its Puritan form which connects goodness chiefly with self-abnegation, fortitude etc. and evil with self-indulgence. Hence his history of Cromwell is a genuine success. The want of community of sentiment in the case of the French people led him, Taine thinks, to misunderstand the French Revolution and misrepresent its leaders. We think, however, that the History of the French Revolution is Carlyle's masterpiece for the reasons indicated in the first paragraph of this article.

And now we must take our leave of Carlyle. The contributions he has made to human thought, the stimulus he has given to our intellect, the trumpet-call one hears again and again in his works to a life of strenuous good works, though only, it may be, to some aspects thereof and with the other side of the picture greatly exaggerated, constitute his claims to our earnest attention. It is not possible to display within the compass of a short article all or even most of the treasures of that wonderful mind. Our only intention in writing this short notice of the sage of Chelsea is to draw readers of this magazine to the study of a mind where the flashes of intuitive genius throw light on some of the most interesting problems that are ever engaging the attention of the thoughtful and the contemplative.

J. R. BANERJEE.

A FEW STRAY THOUGHTS ON KALIDASA.

Again some scholars urge that Kalidasa had full knowledge of true origin of the lunar eclipse and they put forward in support of their evidence the following passage of the Raghuvamśa :—

ह्याया हि सप्तः शशिनोऽसृजं नवरूपिता शुद्धिमतः प्रमिश्रितः

According to both Hemadri and Mallinatha, the above does not refer to the phenomenon of the lunar eclipse, but it accounts for the spot or stain often visible on the lunar orb. (28)

It is mentioned above that the Yavana astronomer had introduced the signs of the Zodiac together with zodiacal astrology into India some where between the fifth and 3rd century B. C. and the Hindu astronomers observing the utility of the science adopted it and subsequently assimilated it into their own. The earliest mention of the word यवन is found in Panini IV. 1, 49. Dr. Bhandarkar places Panini in the beginning of the 7th century B. C. The second allusion is made by Patanjali in his महाभाष्यः. In commenting on Panini III. 2, 111 he gives अक्षन्तु यवनः साकेतम् in illustration of Katyayana's rule of the imperfect tense. The यवन alluded to here is the Indo-Bactrian prince Menander. Here Dr. Bhandarkar observes :—'According to Strabo, Menander pushed his conquests up to the Jumna. In the Gargi Sanhita the Yavanas are mentioned as having conquered Siketa, Panchāla, and Mathura, and penetrated even to Kusumapura or Pataliputra, of the Indo-Bactrian kings Menander seems to have come in close contact with the Indians. There is a work in Pali called Milinda Panho which gives an account of a religious conversation between a Yone (यवन) king Milinda (Menander) and a Buddhist sage, Naga Sena. There is, therefore, every probability that it was Menander that laid siege to Saketa alluded to by Patanjali. The Indians called the Greeks only यवन. Asoka calls Antiochas, king of Syria, a yona-rajā (यवन राजा).

(28) Hemadri quotes ज्योतिष here :—

शशमेकै भ्रमन्तं भूच्छायामपरं विदुः । इन्द्रोर्मण्डलं मालिन्यं
दमः पञ्चमसं परं ॥

Milinda or Menander is so styled in the Milinda panho and in the Gargi Sanhita, the Yavanas are spoken of as good astronomers; whereby the Greeks must have been meant. Kanikola and his successors are called Turushkas in the Rajatarangini and the Indo-scythians who overran a large part of the country were called Sākas. Persians or Parthians are spoken of as Pathavas; and the Huns who poured into the country later, are styled Hunas. So that each of these foreign tribes was called by a distinctive name during this early period and there was no confusion. By the name यवन therefore Patanjali could not have meant a prince of any other than the Greek race" (29) Panini makes mentions of the Yavana alphabet (यवनाक्षर) and hence it follows that in the beginning of the seventh century B. C., the Yavanas had settled in India and the people of this country had recognised their language.

A tradition narrated in the Ceylonese work, Perakumba sivitā, says Kalidasa was contemporary of Kumārādass, the poet king of Ceylon, who ascended the throne in 515 A.D. It is said that this Kumārādass was a scion of the Maurya dynasty and was son, according to the Pujavali, of Mudgalāryana. After a glorious reign of 9 years he is said to have perished by throwing himself on the funeral pile of his friend Kalidasa. Principal Dharmārāma Sthavira describes in his edition Janakiharana the story thus : Kumārādass was in the habit of frequenting the house of a beautiful courtesan. On one of these visits he wrote on the wall the following lines :—

कमलं कमलोत्पत्तिं यूयते ननु दृश्यते ।

Under these lines a notice of munificent reward for the completion of the Samasya was also announced. Kalidasa, then on a visit to this royal bird whose poem he had seen in India, took lodgings that evening in the same mansion and happening to see the lines written on the wall completed the Samasya by adding the following :—

वात्तं तव मुखार्थेन दृष्टम् इन्दोवरहस्यम् ॥

This compliment instead of doing him good

(29). Bhandarkar's paper on the date of Patanjali, p.p. 16-17.

roused the evil passion of the courtesan, who, to secure the promised reward, murdered the poet and concealed his body. The next day she demanded the promised reward from the king, but the king, detecting in it the highest genius of a real poet, would not believe her and insisted in her disclosing the real author. The poor girl told him everything and the king burned himself in funeral pyre of the poet. This story is attributed to Kalidasa's wife in Hindusthana (30). From the above story it can easily be inferred that Kumaradasa was one of the greatest admirers of Kalidasa and this is almost literally true when we but compare his *Janaki Harana* with any of the Kavyas of our poet, especially his रत्नमाला. The जानकी हरण is no doubt a close imitation of K's great epic. Most of the verses are saturated with the legends of the Ramayana and with the style of Kalidasa. Kalidasa's words, phrases, metres, and figures of speech are interwoven in almost every verse of the Janakiharana.

In his *Sakuntala* Kalidasa brings in some idea of the law of inheritance and the law of theft as prevailed in his times. In Act VI, the prime minister submits a report of the case he has decided. "A merchant of the name of Dhanamitra trading on the seas died in a ship-wreck; and he is without an issue. The whole of his immense property becomes by law forfeited to the state." The king then enquires and says that the child in the womb has a right to his paternal state. This exactly corresponds with the law laid down by Vasistha, for he says—"And (let it be delayed) until those (widows) who have no offspring, (but are supposed to be pregnant), bear sons." (31) And further. In the 83rd he says—"On failure of those two the king inherits." From these passages in the *Sakuntala* it is clear that in Kalidasa's times widows were not entitled to inherit the property of their husband. The king orders an enquiry to be made,

not whether there is a widow of the merchant, but whether any one of his wives was pregnant and and the king's final decree is that the child in the womb is entitled to inherit the property of his deceased father. The prime minister seems to have inquired whether there was a child living and not whether any one of the wives of the merchant was big with child, and our poet thus puts into the mouth of the hero a most questionable point of law. The right of the widow to inherit the property of her dead husband was gradually recognised. Manu, Apastamba, Bandhayana and Vasistha do not recognise a widow as heir to the property of her dead husband. Apastamba says—"On failure of sons the nearest sapindas (takes the inheritance)" (32). Narada makes provision for her maintenance. Katyayana says that a small part of the property of the husband should be kept apart for his widow's maintenance. Gautama recognises her share along with the sapindas, sagotras and with those connected by descent from the same rishi. *Brihaspati* also seems to recognise her right to the estate of her deceased husband, for he says—"of him, whose wife is not dead, half his body survives. How could any one else take the property while half (his) body lives? The wife is declared to succeed to her husband's property and in her default the daughter." (33)

Sankha, Likhita, Yagnavalkya and Vyasa also admit the right of widow. In this way we find the gradual development of the right of a woman after the death of her husband. And it appears that this right of a widow is not recognised in the case brought before the king Dushyanta. Thus we are wrong if we say that the drama of *Sakuntala* was composed after Manu, Apastamba, Bandhayana and Vasistha and before Narada, Katyayana, Gautama, Brihaspati, Sankha, Likhita, Yagnavalkya and Vyasa. Prof. J. Jolly assigns the first century A. D. to be the probable date to Brihaspati. (34) We must therefore place the *Sakuntala* long

(32) Sacred Books of the East, vol II. Part I, Prasna, II Patala 6, Khanda 14—St. 2. P. 132

(33) Sacred Books of the East vol XXXIII. Part I, Narada Brihaspati P. P. 377—78.

(34) Sacred Books of the East vol XXXIII. Part I. Narada and Brihaspati. Introduction P. 275.

(30) Dr. Bhau Daji says that the name of K's wife was in all likelihood, ककुत्स्थ.

(31) Sacred Books of the East, vol XIV. part II. Chap XVII St. 41.

before this date and this is consistent with what we have said about the date of Kalidasa.

The next point is one of criminal law. In the *pravesaka* (Act VI) the police man *Suchaka* and *Janaka*, acting under *Syala*, the mayor of the city, get hold of the fisherman with a diamond ring which they at once recognise to be the signet ring of the king. The poor fisherman is at once charged with theft. The punishment that is expected for this offence is *death*. It would appear thus that for the theft of a gem there was *capital punishment* in the time of Kalidasa. Now if we trace the law of theft (specially the theft of a gem and other highly precious things) from the time of *Manu* to that of *Brihaspati* we find that the punishment for the theft of a gem has gradually been reduced from *death* to *fine*. *Manu* says—"Property lost and afterwards found (by the king's servants) shall remain in the keeping of (special) officials; those whom the king may convict of stealing it, he shall cause to be slain by an elephant. (35) He says again—"For stealing men of noble family and specially women and the most precious gems, the offender deserves corporal (capital) punishment. (36) According to *Apastamba*, a thief and a homicide both deserve capital punishment. So does *Bandhayana* enjoins the thief to approach his sovereign with a club on his shoulder and pray to him to punish him with the club. *Vasistha* also prescribes capital punishment for the thief. *Narada* says for stealing a hundred palas worth of gold, silver, or other precious metals or finest clothes or very precious gems, corporal punishment shall be inflicted. *Brihaspati* prescribes fine for theft. He says that in the case of women, men, gold, gems, the property of a deity or Brahmana, silk, and other precious things, the fine shall be equal to the value of the article stolen or double the amount, as the king thinks proper or the thief shall be executed to prevent a repetition of the crime. *Yajna valkya* says:—"Having caused restitution of the stolen property, the king shall cause the thief to be punished by different modes of cor-

poral punishment." Thus we see that in the times of *Manu*, *Apastamba*, *Bandayana*, *Vasistha*, *Gautama* and *Narada* the punishment for theft was death. As civilisation advanced, the means of protecting property increased and there was greater safety and security of people's property. Death was then thought to be a very severe punishment for offence of theft, and gradually an option was made. The punishment that was introduced at the time of *Brihaspati*, *Yajnavalka* and *Vyasa* was either fine or death. It appears therefore that the law in the days of Kalidasa had not attained that mild stage, so evident in the *smritis* of *Brihaspati*, *Jajnavalka*, *Vyasa*. The earliest probable date of *बृहस्पति* is the first century A.D. and so *Kalidasa* may be placed long before this date. Another instance of this is found in the *Vikramovasiyam* of the poet, where king *Pururava* says—"आत्मनीवधम् बाह्यर्चाकासी विद्वगतस्करः। येन तत् प्रथमं स्तेयं गीमुरैव गृहे कृतम् ॥ Here the *विद्वक्* says—असम् अपराधी शासनीय एव। And the king then says—सम्यगाह भवान्। धनस्त्वावत्। From the above it is quite clear that at the time of Kalidasa the punishment for theft was *death* and no option of any kind was made. *Manu's* law was very popular and greatly respected; for in *Raghu XIV—67* he says—"दृष्ट्वा वधायाम पालनं यत् स एव धर्मा मनुजा पथीतः।

The language that is put in the mouths of the police men and the fisherman is *सागध*. From the edicts of *Asoka* and from other palaeographical sources we know that the spoken language of Northern India at the time was *Magadhi* with slight variations. *Kalidasa*, therefore made his low characters speak in their native tongue

U. N. VIDYABHUSANA.

FAILURE.

[Dear Mr. Editor,

While out on a walk on the sea beach at Puri I felt drowsy and sat down on the cold sand. It was then that I thought I heard a sermon (the text of which I reproduce below) preached by some body facing the waves. On a closer and dreamy observation I detected that it was Time

(35) *Manu VIII. 34.*

(36) *Manu VIII. 333.*

addressing the waves. On the merits of the sermon, I have nothing to say and give it to your readers for what it is worth—

Yours etc. H. M. J.

Does man always fail? Is it always the cursed fate of man to struggle without ever coming to a solution of his difficulties? To things of the spiritual, to struggles of the much honoured and little known soul I am not alluding. The simple, wholesome, healthy aspirations of the mind are so very urgent in their demand to come to a clear space of ground from which the outlook on life would be at least endurable, that choke it as you will, struggle will rise up from time to time, ever at the next instant to be forgotten under the sweep of some passing hurricane of dream.

From first to last everything, everyone has failed. Periodic cyclones of Passion sweep over the world making it an intangible phantasmagoria in the traditions of History. One chapter of your History adumbrate the failure in the next. Of definite standards, of transcendent timeproof principles there is not a trace to be found anywhere.

Your goodman—your priest is Robespierre—we forget his crimson hand—your warrior is Napoleon—we forget Helena—your Statesman is Bismark—we forget his patron prince—your litterateur is Voltaire—we forget his snobography—your economist is Adam Smith—we must forget his proverty and your Scientist is Oliver Lodge and we must of necessity forget his rubbing nose against spirits.

Your Buddha is now in Bangkok—your Christ has turned his cheek in Tripoli—your Vedas are in Germany to be charged with Schopenhauerian energy and inspiration—and what is more the British admiralty has failed to launch their biggest air ships

Failure, failure on all sides has made existence intolerable. If you are a sincere student of History ask yourself if you have got any light as to the underlying Forces that work so very mysteriously the destinies of Nations and Individuals. Your Diogenes has been granted a permanent settlement in his tub—no one dare

unearth him now—your Dialogues of Plato had better been replaced by Physiology-cum-Psychological jargonism; your nebular theory has been left to its own course probably towards the Pleiades, there to be condensed—and your Dalton with his theory is now preserved in well-sealed volumes within the conservative walls of Indian Universities.

There is no hope, not a shred of hope of walking out of this pinfold into some bracing atmosphere of serene Intelligence. Mind, matter and sense, desires, aspirations and longings—of the mind and the soul—all thrown into, a confounded jumble, have by their combined confederacy rendered earthly shackles so very tyrannically powerful that nothing less than a sheer herculean effort will ever be able to shake them off. And would to God that that effort, the only consolation for its potency might surge up in the hearts of my yeomen friends.

Am I a pessimist—you think I am a misanthrope?—Oh God! No! If your words are not all in all break forth the forms of convention and come before the bar of reasoning. If I am a pessimist—what then? Am I responsible for forces working within me the aggregate expression of which you complacently call Pessimism and turn away? If my verbal plethora seem all too incoherent to impress you what am I to do with the load of my convictions? If my mind want so much, if my heart crave for so much, and I working and fighting and fretting always to bring my outer self in line with my inner impulse, always to harmonise the theoretic with the practical and always and irrevocably see Failure a standing obstacle against Realisation, why then! let loose all bounds of Pessimism—let bitterness, acrimony, hatred go to war against existence. Scientific grandees fluttering in voluptuous motor cars and electrified saloons, devising sky scrapers and running factories lolling and rolling in the coined blooddrops of the impoverished working class might offer very plausible explanations and consolations, but I would sooner die a thousand deaths than accept their time serving theories. Accomodation I can have none except with Providence and the mandate of that

providence I see not in the poor scintillations of your scientific civilisation but in the latent glow of my conscience.

Vampire-like Failure sat feasting upon my heart's blood all these ages—I cannot, will not have any accomodation—I shall not stoop to conquer like your pettifogging scientists—sorry I have not had such a fund of chicanery, perfidy and dissimulation, but I will grasp it, break it, weld it, mould it, regenerate it and make out of it an effulgent success in.

TIME.

TEACHING OF ASTRONOMY AS A SEPARATE SCIENCE SUBJECT.

One of the most notable achievements of the reformed Universities is certainly the introduction of practical work in the curriculum of Scientific subjects. The old blackboard-cum-chalk method of teaching science has happily been consigned to the eternal region of forgotten facts. When the new Regulations were first promulgated grave misgivings were entertained whether the Colleges would be able to conform to them so far as science teaching was concerned. But happily one sees at the present moment physical and chemical laboratories springing up like mushrooms in all parts of the country not certainly like the goddess Minerva clad in the full panoply of war, but undoubtedly with decent and workable fittings on a modest scale. The readiness and alacrity with which the colleges have responded to the call of the "alma mater" in putting their houses in order in the face of great difficulties go a great length to show that the new method of teaching science has been fully appreciated by the educated community. Grants of large sums of money placed by the Government of Bengal at the disposal of the University for disbursements amongst the private colleges coupled with endowments from private gentlemen have solved, though by no means adequately, the perplexing money problem which was undoubtedly the crux of the whole situation. The stigma which once deservedly attached itself

to the old B. A. in science for never having held a test tube or a pendulum in his hand in his life will no longer touch the fair name of the new science graduates. By making practical work compulsory from the Intermediate to the M. Sc. standard for all students aspiring to scientific learning the University has infused real life into both teaching and study of scientific subjects. The students instead of looking on these subjects as full of unmeaning high-sounding jargon have indeed taken very kindly to them. In fact this new augury of real scientific learning in our country may justly be looked upon with complacency by the authorities of the new Universities as a highly beneficent gift to the country and all honour would go to the pioneers of this noble venture.

The scientific subjects which have thus been honoured with special notice are Chemistry, Physics, Botany, Zoology, Physiology, Geology, Geography and even Experimental Psychology—a branch of science still in the nebulous zone of development, still a shapeless foetus in the womb of futurity—but not Astronomy. I am completely at a loss to divine what earthly or unearthly errors either of commission or omission has poor Astronomy committed to deserve such a cold neglect in the hands of the University authorities. There can *absolutely* be no difference of opinion regarding the obvious fact that Astronomy is as much a physico-mathematical branch of science as Physics for instance. Instead of assigning its proper place in the category of scientific subjects it has been tagged on to the already too long tail of Mathematics. I am a graduate in Astronomy (*i. e.* I read Parker's Astronomy in my B. A. classes and saw the beauties of the blue heavens on the black-board in broad day-light), but I confess—and I am not ashamed in confessing—that I can glibly give you the definition of *pafallax*, hour-angle etc. but cannot point out to you which is Jupiter or Saturn or handle an astronomical telescope. The whole system of teaching Astronomy with a piece of chalk on the black-board is an utterly farcical affair and the sooner it is amended the better for the fair name of the Uni-

versity whose glorious motto is "advancement of learning." Let the University realise that profound ignorance regarding the first principles of practical astronomy pervades the land which once gave birth to a Aryavarta, Barahamihir Brahmagupta and Vashkaracharja, and that this ignorance will continue for ages and ages to come so long as the present system of teaching the subject is not completely annulled or at least greatly modified.

Not that the new University is wilfully negligent of its obvious duty in respect to this subject. There are certainly difficulties in the path of making the subject thoroughly practical but the time has come when the difficulties should steadily be grappled with and not shirked. I shall attempt to deal with these supposed difficulties one by one.

(1) The first and foremost difficulty is undoubtedly the question of finance. The erection of suitable observatories is a costly affair and if astronomy be made a separate science subject with theoretical and practical teaching, most of the colleges will have to cease teaching the subject as at present. I confess that I am not much impressed with the insuperable nature of this difficulty. The erection of suitable physical and chemical laboratories is certainly not less costly. I know the figures for the Rajshahi College. The Government of Eastern Bengal has spent about forty thousand rupees in the equipment of the chemical laboratory and would shortly spend more than that amount in the construction and equipment of the proposed new physical laboratory. The upkeep of the two laboratories costs the Government about £300 per annum. I am told that the munificent Maharaja of Cossimbazar has spent more in furnishing the physical and chemical laboratories of the Berhampur College.

Several lakhs of rupees have already been spent by the Government of Bengal for the equipment of the Physical, Chemical, Geological and Biological laboratories of the Calcutta Presidency College. The Dacca College is rapidly being brought into parallel lines with the Presidency College and already more than a lakh of

rupees have been spent in the construction and equipment of its Physical and Chemical laboratories. The private colleges have also spent large sums of money in the equipment of these laboratories. Let it be distinctly understood that these laboratories have arisen *as a result of* making the study of Physics and Chemistry thoroughly practical and *not before*. How can it then be expected that observatories would exist *before* the study of Astronomy is insisted to be conducted on rational lines? It is of course understood that the financial conditions of most of the colleges will not permit of construction of observatories, but certainly Government Colleges may be expected to provide proper facilities for the teaching of the subject. If however every college fails to make such arrangements, the premier model college of Bengal which has already undertaken the task of teaching Physics, Chemistry, Geology and Biology will certainly come to the rescue. Is Geology taught in every College? Is Geography, Physiology, Botany or Experimental Psychology taught in every College? Thanks to the indefatigable zeal of Mr. C. Little for Astronomical studies, the Presidency College already possesses a decent observatory which may be easily expanded to meet the requirements of B.A. B. Sc. and M. Sc. students. My point is this—the construction and equipment of observatories is certainly not more costly than the construction and equipment of physical and chemical laboratories and observatories would be constructed in at least some of the colleges if Astronomy be made a separate science subject and taught theoretically and practically.

(2) Then as regards the contention that the colleges at present affiliated in Mathematics will cease to teach Astronomy, I would like to ask the question "of what earthly use is this book learning of a modicum of astronomical definitions to the student?" If it be abolished will any graduate be less educated for the matter of that? If such teaching be countenanced in the case of Astronomy, why has the study of Physics, Chemistry etc. been limited and made expensive? It is enough if one fully equipped college turns out a dozen astronomers every year.

(3) There are some minor items in the list of difficulties such as the following :—(a) practical classes will have to be held in the evening, (b) that there will be some difficulty in holding practical examinations. As regards these the method already adopted by those Universities in Europe and America such as London, Edinburgh *etc.* in which Astronomy is taught as a separate Science subject may be easily followed. The syllabus of both theoretical and practical work may also be borrowed from those Universities.

In order to bring the importance of the subject to the notice of the authorities of the Calcutta University I sent a note to the syndicate in the form of a resolution proposing "that Astronomy be made a *separate science subject* like Physics, Chemistry *etc.* and taught both theoretically and practically from the I. Sc. to the D. Sc. standard, Physics and Mathematics being made compulsory for those who would take up the subject in the I. Sc. and B. Sc. Examinations." The resolution was submitted to a joint meeting of the faculties of Science and Arts for consideration which was held on the 20th November, 1909 (Vide minutes of the Calcutta University, 1909 Part IV, p. 372-3)

As ill-luck would have it, the motion was, through oversight, already *ultra vires*, as *Chemistry being already a compulsory subject* in the I. Sc. examination the resolution made *four* science subjects *viz.* Astronomy, Physics, Mathematics and Chemistry compulsory for the I. Sc. Examination while according to the Regulations only *three* science subjects could be taken up. I did not know that Chemistry was a compulsory subject in the I. Sc. and the *ultra vires* nature of the resolution was pointed out to me by some friend only on the day on which the meeting of the faculties was held. There were two amendments in the agenda paper of the meeting—one to have been moved by Principal Mitchell who attempted to save my resolution from its *ultra vires* nature and another by Principal F. C. Turner who was of opinion that instead of making Astronomy a separate science subject a scheme of practical work in Astronomy be drawn up for those students who would

take up Mathematics at the B. A. or B. Sc. Examination. The motion being *ultra vires* though moved by me, could not be seconded and consequently no discussion did take place on the subject.

Before moving this resolution I wrote to many professors of mathematics and Principals of Colleges inviting their opinion on the subject. The great majority of them were unanimous that the introduction of astronomy in I. Sc. Examination would be premature and acting on their advice I was, willing to substitute the words B. Sc. for I. Sc. in my resolution at the time of moving it (vide Minutes, Ibid). Again they were almost unanimous in their opinion that something should be done in this matter though not agreeing with me in the matter of details. It would be interesting to note the opinions of some of them. Dr. C. E. Cullis of the Presidency College was of opinion that practical examination should be made compulsory in the M. Sc. Examination. Prof. Thomson the Scottish Churches College very kindly took me to his house and showed me a collection of slides, models, small telescopes (most of them bought second hand) with the help of which he used to illustrate the lessons in astronomy he gave to his students. The collection cost him several hundred rupees only and was an admirable beginning in the right direction. He was however not much in favour of my resolution and argued with me that it would deprive hundreds of students the little knowledge of astronomy they picked up in their B. A. and B. Sc. Classes. I could only reply that the little knowledge they obtained of astronomy was worse than useless. Principal Mitchell, whose zeal in matters astronomical is well-known, was on the other hand very enthusiastic over my resolution, though he did not support it so far as the I. Sc. Examination was concerned. The Principal of the St. Xavier's College, while sympathising with my resolution, replied that the existing observatory in the college was essentially a solar one and as the college had lately incurred heavy expenditure in connection with the physical and chemical laboratories, it would not be possible for the college at present to extend the obser-

factory. The Secretary of the Indian Association for the Cultivation of Science where I found a magnificent telescope some years ago, wrote to me that the association might make arrangements for teaching astronomy practically but the University might not recognise the association's work as the association was not a regular college. Principal F. C. Turner's opinion has already been referred to as he gave notice of an amendment in which he proposed to draw up a syllabus of practical work in astronomy for students taking up Mathematics in the B. A. or B. Sc. Examination.

There is much to be said in favour of Mr. Turner's opinion on the ground that half a loaf is better than no bread or more appropriately as the Bengali proverb would have it, that a blind maternal uncle is better than none at all. One great difficulty would be that the course of Mathematics would be rather too heavy with this additional burden. A second difficulty would be that colleges which have already been affiliated in Mathematics would have to be disaffiliated in case they fail to satisfy the new requirements regarding practical work in Astronomy. If these two difficulties prove of less consequence in comparison with the advantages to be derived from practical acquaintance with the subject I would recommend the adoption of Mr. Turner's amendment by way of a beginning. If I had understood Mr. Turner's proposal he did not insist on practical examination in the B. Sc. Examination. Practical work without practical examination is no new thing in the University as it already exists in the I. Sc. & I. A. Examinations. As regards the advisability of holding practical examination in the M. Sc. Examination I hope all will agree with Dr. Cullis.

I understand that the Regulations of the Calcutta University are shortly going to be revised and I have written this article with the hope of attracting once again the attention of the University authorities to this matter. It is a matter of regret that a University, presided over by a Mathematician of the calibre of the Hon'ble Mr. Justice Mukherji, should neglect the study of such a highly important and interesting subject as Astronomy. I hope that Dr. Mukherji will take the

initiative in this matter and lay the foundations of the study of Astronomy deep and sound so that the country may be ripe in the fulness of time to give birth to another Barahamir or Bhaskaracharya.

Conclusion.

What I have ventured to suggest in the foregoing pages is to make Astronomy a separate Science subject like Physics, Chemistry etc. in the B. A. B. Sc. and M. A. & M. Sc. Examinations. The subject should be taught and examined upon both theoretically and practically. Mathematics should as a matter of course be made compulsory in the B. A. and B. Sc. Examination for those students who would take up astronomy.

A less satisfactory alternative would be to keep Astronomy part and parcel of Mathematics as at present but to draw up an *elementary* course of practical work which every student of Mathematics should complete before he is permitted to appear at the B.A. and B. Sc. Examination. There would be no practical examination in Astronomy so that far as B.A. and B. Sc. Examinations are concerned but a practical examination is a great desideratum in the M.A. and M. Sc. examinations.

Rajshahi
25-11-11.

PANCHANAN NEOGI.

IS SPACE AN EXTRAMENTAL REALITY ?

To obviate this difficulty, a subject—a real, living Principle of Energy—that which will assimilate and discriminate the sensations, is to be posited. And this is how Liebnitz tries to solve the question. Thus, he writes "Space and Time are not real substances nor attributes of real substances. They are nothing but orders or arrangements of co existing and successive things or phenomena." Space is to be regarded not as the mutual exclusiveness of real substances, but as simply the order of co-existence. Hence, space with him is merely phenomenal or ideal—a confused perception. In our days, a theory of this kind, has been advanced by Herbert Spencer; he agrees with Liebnitz in making space purely

phenomenal.* Thus he speaks of the origin of the idea of space: "From a building up of muscular adjustments minus the resistances (blank forms of co-existences, from which the co-existing objects are absent) results the abstract of all relations of co-existence which we call space." But this idea of space, he goes on to say, is evolved not in the life-history of the individual, but during the whole course of the gradual evolution of intelligence, in the history of the human race. Thus what was once *learned a posteriori* by our ancestors, is *known* to us *a priori*. From the above account, we may say that Spencer, like, Liebnitz, does not make space an extramental reality—he invests it only with a relative Reality thus he writes, "our conception of space is produced by some mode of the unknowable." Again "though reality under the forms of our consciousness is but a conditioned effect of the absolute reality, yet this conditioned effect standing in indissoluble relation with its unconditioned cause and being equally persistent with it so long as the conditions persist is to the consciousness supplying these conditions, equally real."

Spencer, it seems, is not unambiguous on this point. He derives the idea of 'space' in much the same way as the empiricists do, only throwing it back to the remote ancestors. But then, one might argue that all the objections that are urged against the empiricists may, with equal force, be urged against Spencer. Spencer's conception of the absolute, however, to some extent removes such objections. When he makes both space and time to be but the modes of the absolute, does he not almost fall back upon the pantheistic position of Spinoza? Against both Liebnitz and Spencer, it may be urged that vesting space as they do with a relative reality—a reality borrowed from some other being whose existence they assume, they cannot say properly what space is in itself—and the question that is at issue cannot be answered. Moreover, they cannot explain the relation between the absolute and its mode.

Amidst all this whirlpool of criticisms and

* Spencer is not consistent throughout in his conception and account of space.

controversies comes the trumpet voice of the greatest critic of the modern philosophical world, Kant. He tries to unite, reconcile and correct all the above views and gives quite a new conception of space in his work "Critique of Pure Reason." Space according to him, is an *a priori* form of the sense faculty. "Space is nothing but the force of all phenomena of the external senses." It is the subjective condition of our sensibility without which no external intention is possible for us." Thus, space, with him, is empirically real, but transcendently ideal. Thus, he writes "It is from the human standpoint only that we can speak of space, extended objects etc." Again, "this predicate is applied to objects only in so far as they appear to us and are objects of our senses." Thus we see that Kant attributes "reality" to space—but only an empirical reality, which, by our definition, is no reality at all.

Kant's doctrine, we may remark, is opposed to and at the same time mediates between all the above views. He would agree with the realists in saying that space is a reality in so far as phenomena are concerned, but he would most emphatically deny its transcendental and extramental reality, with the empiricists he would say that space is purely phenomenal but he would differ from them in holding that space is an *a priori* intention rather than an aggregate of *a posteriori* sensations.

Kant's doctrine of the subjectivity of space raises quite a host of critics from the other schools declaring 'eternal war' against his system. It would not be out of place here to discuss one or two of such criticisms, for they would give us a true insight in the Kantian doctrine. The empiricists would argue that a bad psychological error has vitiated Kant's system. Thus, they say that the elements of experience cannot be separated in the way in which Kant does separate them. Hence it is absurd to think that some elements of experience (space and time for example coming from within and the "manifold of sense" coming from without) come from the self and the other from the not-self. Perhaps this criticism is sound enough so far as it goes. We know that Kant falls into the error of "psychological atomism."

which his followers try to correct for him. But here the criticism seems rather out of place because we are here concerned with the origin and nature of space and not with the origin of knowledge. We do not here ask whether Kant is strictly justified in still clinging to the idea of an extramental "Ding au Sich" (thing-in-itself), we are concerned with the validity of the hypothesis of the *a priori* origin of space.

Tendelenberg, among the realists raises his objections against Kant's doctrine. He says that, according to Kant space is subjective, but there Kant can never prove that space is *merely* subjective and cannot be objective as well. But we may ask, what is objective? (i) If it means valid for objects that are phenomena, Kant would admit the objective reality of space. (ii) But if it means an existence *par se* apart from all relations to possible experience, Kant would disagree. If space were a property of things-in-themselves, Kant says, we could not determine its nature *a priori*, "for no determination of objects * * * can enter into our intuition before the actual existence of objects themselves." Such knowledge, he says, would be impossible and would depend upon inspiration.

We may, now, with reason enough assert that Kant's doctrine of the subjectivity of space may be well defended from his stand point. This theory has the singular merit of effectually deciding the question of perception. A most remarkable fact, we may note in passing, is that this—perhaps Kant's greatest discovery in Philosophy—has influenced quite a large number of master minds.

But this splendid discovery—highly philosophical as it is—is not altogether free from faults. And we think that there is sufficient strength and justification in Spencer's criticism of it. Thus Spencer would argue that the consciousness of space is carried on in extremely different degrees by the different senses of touch, sight, taste etc.—a fact quite unaccountable if space were given before all experience as a form of intuition; that our consciousness of adjacent space is more complete than our consciousness of remote space is also at variance with this hypothesis; that in

morbid states, space would appear "swelled", is on the Kantian theory, unaccountable, seeing that the form of intuition should remain constant whether the intuition itself be normal or abnormal. Again we may ask why should ego produce from within itself the form of sensibility alone and not its matter?

Thus, it is that we are driven on to seek refuge in Fichte. According to him space is but an aspect of the objectification of the Ego itself. The Ego in order to make thought possible and knowledge real must think an *object* which it projects out, as it were, from within itself. Thus, with him space loses all objective reality and becomes more than ever a mere subjective form—only an instrument to make the self-realisation of the ego more deep and concrete. But then the ground work of Fichte's philosophical system is defective; in order to make the ego real, an "absolute" is necessary, otherwise his system degenerates into a form of "sollepcism"; and again, if this "absolute" is posited, some of the old difficulties that infect Berkeley's System return.

Hegel treats of "space" in his "Philosophy of Nature." The account and explanation that he gives of "space" is deducible from his general philosophical principles. His system begins with the Absolute Idea or the Idee and ends in the Absolute Spirit. Between these two come the in finite process of the self-realisation of the absolute. Everything in this universe from an infinitesimal and abstract atom to the most perfect and concrete human organism is but a phase or aspect of the self-evolution of the "absolute." Space and matter are the primary conditions of nature—they are the most abstract, the most vague and the most intangible productions of the Creative Thought. Like "being" space exists and does not exist. This principle of contradiction, in space, as in everything else, sets the world-evolution in motion, without "space" there would be no material or external objects, so 'space' is the *conditio sine qua non* of our sense-perception. It is the principle of determinateness or differentiation that makes experience possible. Its origin, like the origin of everything else, lies in the

inner necessity of the absolute Idea to realise or evolve itself. Thus according to Hegel, space is real—not in the sense that it exists in and by itself apart from Mind—but real in the sense of being a stage or process in the world-evolution. It is not merely "Empirically real," but "transcendentally ideal", as it is in the Kantian system, it is real in the sense that it is "necessary."

Let us now examine how far the Hegelian doctrine has helped us to solve our problem. Criticism of the Hegelian account of space would necessitate a critical survey of the whole Hegelian Philosophy—its fundamental principles of Thesis, Anti-thesis and Synthesis—which would be unattainable within the body of this short paper. So we will notice only one or two points. Hegel's definition of "reality" being entirely different from our accepted definition, we are precluded from saying anything as to whether 'space' according to Hegel is real. If by 'reality' no more is meant than 'necessity'—would not even our illusions and dreams be real? Would not 'reality' then like 'necessity' admit of degrees? And might we not then pertinently ask what measure or quantity of 'reality' are we to vest our 'space' with? And then, again the same old and unanswerable question crops up "what is the standard of reality." These are questions, we believe, to which Hegel, so far as we have been able to understand him, returns no answer.

In conclusion, then, we must have to admit that if knowledge is to be made possible and perception real, space must be objectively valid. But we discard altogether the conception of space, as a reality existing *per se* apart from and independent of mind. It is somehow or other, we cannot say exactly how, supplied by the activity of reason. This reason, be it noted, is not the narrow individual, human faculty, as in Kant,—it is, on the other hand, the eternal process of the world evolution and its Eternal Law. But this is after all, be it remembered, but a working hypothesis. We can only say that space cannot exist independently of mind—and this is only a negative assertion. But as to the exact nature of 'space' we must remain ignorant, so long at least as we

will have to partly depend upon our senses for perception. If we could ever see 'reality' and 'absolute' face to face, as it were, then and not till then, we would be able to say what space is in itself.

SITARAM BANERJI.

STUDENT'S SECTION.

THE ADVANTAGES OF COLLEGE EDUCATION.

There are, indeed, notable instances of men of vast erudition and of unquestionably high morals, who did not get their education from colleges. But such men, very few as they are in number, did not prosper, as a rule, in the political and the scientific world, but in worlds literary and philosophical, as we see in Shakespeare and Fergusson, Spencer and Socrates.

If students come to colleges merely to learn the paraphrase of books, and to be hustled up for their examination, it should be called a very mean aim. Such cram, such narrowing of education, may as well be effected at home. Educationists have failed to condemn such practice, appropriately. "I would far rather," said Dr. Anold, "send a boy to Van Diemen's Land where he must work for his bread than send him to Oxford, without any desire in his mind to avail himself of his advantages." The preceptors are, generally, the most educated men procurable in the country, and they are, naturally, of fascinating manners and of admirable moral character. By association with them, the students can lift themselves to a higher level of culture and character; they can get rid of their violences and eccentricities, prejudices and provincialism, as they are likely, or in the words of Mathew Arnold, surely to have.

Even Sir Robert Peel, unlike Demosthenes, thought it proper to be educated in a college to attain his long cherished object. On the contrary, Mill, educated as he was at home, became

so little social, and so little faithful to God, as can be scarcely expected from such a wonderful genius. The self taught Diogenes, though wiser he grew day by day, became so much cynical and ungenerous, that he has well deserved the epithet of 'dog'. The ascetics of India, for that is the name of the dissenters from the religion of universal love, the self taught philosophers, are so many living Diogeneses.

In some institutions of the world we see students coming from the farthest corners of Australia as well as of Canada and South Africa, for instance, we have the Cecil Rhodes scholars at Oxford. In such an intermingling, we can get a better insight into the habits and Customs of the people of those far off Countries, than we get in books. By mutual co-operation we can preach the same gospels from China to Peru with no great difficulty. Interchange of thoughts, and discussion are two great factors in improving our knowledge; and by interchange in learned and varied societies, as all colleges, worthy of the name, have, we can learn what the best genius of the world, could not find for himself. For this, the sages of Naimisharanya, were constantly engaged in hot discussions and mutual exchange of thoughts. Plato and Aristotle, taught their disciples at their Akademeia.

Competition is another great factor in self-culture. Burke's rise in the political world was due to Fox's presence. Demosthenes and Cicero, rose so high because they had no less gifted competitors than Aeschines and Phœcian by their sides. In colleges, students meet with their equals and superiors and the mutual struggle for supremacy leads them all to a higher stage. On the contrary, want of competition, often leads to egoism, and consequently to degeneration.

Colleges are places for contracting friendship, for unlike Indian colleges there are residential colleges in Europe, where the living together and studying together of the students attract them more closely to each other. There—we always meet with a number of simple and honest creatures, the friendship with whom often becomes life-long and an object of constant bliss in the midst of miseries.

Now with the rapid progress of human experience, the number of books is now illimitable. In the present time the theme and scope of any particular book are rather confined and narrow. So to get a perfect knowledge of a subject, the perusal and reference of a large number of books, is necessary. In all colleges, there is an exhaustive collection of books and students can swallow and digest them at their pleasure. While all men, save a few who are blessed, have not got libraries at home, and whenever they wish to read or consult some valuable books they are unable to satisfy themselves and suffer.

For scientific studies colleges are indispensable. No man, however great a mind he may possess, has ever flourished in the scientific world without going through the regular steps of a college education. Some may say that Davy, Dalton, Faraday did not belong to colleges, and yet they prospered. But in those times, there was no college of Science, at all, in the present sense and strictly speaking. Davy and Faraday belonged to the best college—the best scientific institution, namely the Royal Institution of London and Dalton, being a schoolmaster, had got advantages from a similar source. Moreover the science of yesterday is not what it is today. Those men flourished when science was at its very infancy and it was only observing natural phenomena and not enforcing upon them austere mathematical principles. The old idea of science is gone and now the would-be scientist should pass his life in laboratories and in the company of the modern great scientists; and it must be understood, to have such companions and private laboratories, is, a thousand times more impossible than to have libraries.

Another thing is that academical education should not be called, as is often done, a stumbling block to the rise of self help and originality. Perfect intellectuality and genius are not hampered if rightly directed. Milton's education at college simply weighted and heightened his intellect. Milton borrowed much from ancient authors, and he is admired for his originality. Even

Shakespeare, Hugo, Cervantes and Kalidas got the story, or even the plot of their works from ancient writings. Is then Milton's Comus, the same as that of Puteanus, or Abhijñāna Sokuntalam, the story given in the Mahābhārat? College education, as is already said, intensifies and vivifies the mind's stock of impressions. Bright examples of this, are found in Addison and Gray.

In short, college-education elevates the mind, chastens manners, gives prosperity in the political and the scientific world and becomes a source of extending the human sympathy on the Earth. But how few avail themselves of these advantages!

BANKIM CH. BHATTACHARYYA.

First Year Class, Presy. Coll.
Calcutta.



SOLUTION OR HINTS TO SOME OF THE PROBLEMS ALREADY APPEARED.

Prob. 2. [Bankim Bhattacharjee, 1st year class, Presy. Coll. Calcutta]. This theorem is more of historical than of real importance. It was first demonstrated by a Frenchman and his demonstration is given in the appendix attached to Todhunter's Plane Geometry I to VI and XI.

3. [Ibid]. This is the well-known Menelaus' Theorem. Vide Hall and Stevens' School Geometry Page 345.

9. [Ibid]. From the construction $CD : BD = AC : AB$ (Euc. VI. 3). Also $BA : BE :: BF : BC$ for FC is parallel to AE . Again $BG : BE = BF : BD$ for GC is parallel to FD .

$\therefore BA \cdot AC = BE \cdot BF = BG \cdot BD$

or $\frac{BG}{BH} = \frac{BC}{BD}$ or $\frac{BA - BG}{BA} = \frac{BD - PC}{BD} = \frac{CD}{BD}$

$\therefore BA - BG : BA = AG : BA = AC : BA$
i. e. $AG = AC$.

11. Draw through a given point in the plane of two given parallel straight lines, a line parallel to them making use of the ruler only.

Solution by Mr. Keshab Dass De :—(vide fig. 1)

Let P be the given point and AC, BD the parallel straight lines.

Cons :—Through P draw any two straight lines PAB, PCD cutting AC, BD at points A, B and C, D respectively. Join BC, DA and let them cut at O . Join PO cutting AC, BD at E, F resp. Now join AF, DE and let them intersect at G . Join PG . Then shall PG be parallel to AC or BD .

Proof :—We have by Ceva's Theorem

$$\frac{BF}{FD} \cdot \frac{DC}{CA} \cdot \frac{AP}{PB} = 1$$

$$\text{But } \frac{DC}{CA} = \frac{AB}{BP} \text{ for}$$

$$AC, BD \text{ (Hyp)}$$

$$\text{Hence } BF = FD,$$

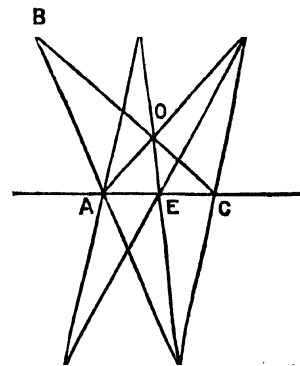
$$\therefore AE = EC.$$

$$\frac{PD}{DB} = \frac{PC}{CB}$$

$$\text{Now } \frac{PD}{DB} = \frac{EC}{CB}$$

$$\text{also } \frac{GD}{DB} = \frac{GE}{EB}$$

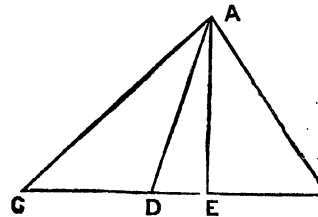
$$\text{Hence } \frac{PD}{GD} = \frac{PC}{GE}$$



Therefore.....Q. E. F.

16. [Mr. Keshab Dass De]. (vide fig. 2).

Let AE' be drawn perpendicular to BC



It is easy to see that if $\angle ADC$ be obtus $AC^2 = AD^2 + CD^2 + 2CD \cdot DE$.

Hence if $AC^2 > AD^2 + CD^2$ the $\angle ADC$ obtuse. \therefore the supplement $\angle ADB$ is acute. Hence we have $AB^2 = AD^2 + BD^2 - 2BD \cdot DE$

$$\text{i. e. } AB^2 < AD^2 + BD^2.$$

Now the excess in one case is evidently $2CD \cdot DE$, and the deficiency in the other is $2BD \cdot DE$.

But if D be the mid. point of BC

we have $CD = BD$.

$$\therefore 2CD \cdot DE = 2BD \cdot DE.$$

Therefore.....Q. E. D.

UNIVERSITY QUESTIONS

UNIVERSITY OF BOMBAY.

Examination for the Degree of B. A. 1911.

MONDAY, 20TH NOVEMBER. 10-30 A.M. TO 1-30 P.M.

ENGLISH (Necessary) (*Text Books*).

3. "Shakespeare does not believe in any sudden transformation of a noble and loyal soul into that of a traitor and murderer." Examine this observation about Macbeth. Or, What use does Shakespeare make of natural phenomena and the supernatural to intensify the tragic interest of *Macbeth* ? 15

[*Bacon.*] 1. Who were the School men ? On what grounds does Bacon find fault with them, and to what extent is he guilty of similar errors himself ? 15

2. What does Bacon mean by History Mechanical and the History of Cosmography, and why does the former play an especially important part in his system ? 15

3. Explain briefly the meaning of the following technical terms in the Baconian Philosophy :—

(a) Categories or Predicaments. (b) Essential forms or true differences. (c) Efficient Causes. 15

4. Explain the following sentences with reference to their context :— 15

(a) Whatsoever motions the spirit of man could act and perform without the organs of the body, the thought might remain after death, which wee only those of the understanding, and not of the affections.

(b) The organs of the senses are of one kind with the organs of reflection, the eye with a glass, the ear with a cave or strait, determined and bounded.

(c) The great sophism of all sophisms is equivocation or ambiguity of words or phrase.

5. "Two words form the key of the Baconian doctrine, Utility and Progress." (*Macaulay*). How did Bacon try to achieve those ends, and with what success ? 15

MONDAY, 20TH NOVEMBER. 2-30 P.M. TO 5-30 P.M.

ENGLISH (*Voluntary*)—PAPER I.

(*The Modern Period.*)

[*N.B.*—Only *nine* questions are to be attempted of which Nos. 4 and 11 are compulsory.]

1. What is Wordsworth's doctrine of the influence of Nature over Man in (a) *The Prelude* and (b) *Ruth* ? 10

2. Why is *The Cenci* termed a "psychological" play ? What part does Orsino take in the action ? 10

3. What interpretation have you to offer of the poet's *purpose* in *Christabel* ? 10

4. Refer any *five* of the following questions to their respective sources, adding a brief note about the poem :— 15

(a) How Wallace fought for Scotland, left the name Of Wallace to be found, like a wild flower, All over his dear country !

(b) Passion ! cried the Phantom dim,
I loved my country, but I hated him !

(c) The sun's rim dips, the stars rush out :
At one stride comes the dark.

(d) Most wretched men
Are cradled into poetry by wrong :
They learn in suffering what they teach in song.

(e) For ever with thou love, and she be fair.

(f) Her very frowns are fairer far
Than smiles of other maidens are.

(g) Pleasures are like poppies spread,

(h) There was silence deep as death
And the boldest held his breath
For a time.

(i) Rose Aylmer, whom those wakeful eyes
May weep, but never see,
A night of memories and sighs
I consecrate to thee.

5. Discuss the claims of *Woodstock* to be regarded as a picture of the religious life of England in the Puritan Age. 10

6. Contrast the work of Mrs. Radcliff with that of Miss Austen. 10

7. What do you know of the literary circles that flourished in Edinburgh during the Period ? 10

8. Give some account of De Quincey's experiences when under the influence of opium. 10

9. Estimate the influence of German literature on English writers of the period.

10. Write an appreciation of *either* Edmund Burke *or* Jeremy Bentham.

11. Write notes on any *one* work in *each* of the following groups :— 15

(a) *Vathek* ; *Guy Mannering* ; *Paston Letters* ; *Caleb Williams*.

(b) *Rejected Addresses* ; *English Bards and Scotch Reviewers* ; *Hyperion* ; *Cain* ; *The Lord of the Isles* ; *Prometheus Unbound*.

12. What are Southey's prejudices as indicated in his *Life of Nelson* ? 10

13. What are the points on which Lamb and Hazlitt resemble, and differ from, each other ? 10

TUESDAY, 21ST NOVEMBER. [2.30 P.M. TO 5.30 P.M.]

ENGLISH (*Voluntary*)—PAPER II. [BYRON.—
Childe Harold, III and IV. The Golden Treasury, Book IV]

2. What should you gather from *Childe Harold* as to the personal character and opinions of the author ? 10

3. Trace Childe Harold's journey from Waterloo to Venice, noticing briefly the historical associations attaching to the principal places he passes. 10

4. "In Byron, we are more struck by the matter than the form." (*Alinto*.) "No poet of equal rank had ever so bad an ear." (*Swinburne*.)

Discuss these criticisms of Byron's style, and compare him as a metrist with his chief contemporaries. 10

5. Collect the chief references to Switzerland and Venice in the poetry you have studied. Account for the popularity of these subjects with the writers of the time. 10

6. Swinburne calls the Odes of Keats the "final masterpieces of English poetry." Discuss the justice of this observation. Which do you consider the finest Ode, and why ? 10

7. Mention the chief lyric poems of Shelley in the *Golden Treasury*, and illustrate by quotations his most characteristic beauties. 10

8. What is a Sonnet ? What are its chief metrical forms ? Describe some of the finest sonnets of the period given in the *Golden Treasury*, with quotations. 10

9. Describe, with quotations, the theory put

forward in Wordsworth's Ode on Immortality. Compare this theory with other similar beliefs of which you know. 10

FRIDAY, 24TH NOVEMBER, [10.30 A. M. TO 1.30 P. M.]

ENGLISH (*Composition*).

(1) "The true mission of science is the amelioration of social conditions." OR (2) "Poetry serveth and confereth to magnanimity, morality, and delectation." Discuss the moral influence of poetry upon the mind. OR (3) "The aims and scope of a liberal education." OR (4) "The heart is a secret even to him that hath it in his own breast."

STUDENTS' DIFFICULTIES.

To

THE EDITOR OF "THE COLLEGIAN."

DEAR SIR,

I send you here one of my "difficulties" and shall be highly obliged if you or any of your readers be kind enough to solve this :—

Please refer to Watson's Text Book of Physics (Fourth Edition, Seventh Impression) Art 458. Tubes of Force :—

The author here proves.— $F \times S = 4\pi$ assuming the charge concentrated at the centre.

[" Now if the Sphere is sufficiently small, we may regard the charge concentrated at the centre etc. etc. "]

In the next article (459) he wants to prove that "the force exerted at an external point by a uniformly charged sphere is the same as would be exerted if the charge were concentrated at the centre of the sphere." But in proving this he assumes the truth, article 458, $F \times S = 4\pi$ or in other words assumes the charge concentrated at the centre, that is, what he is going to prove.

It is needless to mention that we do not (and cannot) think that Mr. Watson is wrong, but as this point has perplexed me and some of my friends we refer this to you for a more clear statement of the arguments.

Krishnagar College

Yours faithfully

B. Sc. Class. 4th year. PANCHUGOPAL DAS.

REVIEWS

The Story of England—A HISTORY FOR JUNIOR FORMS, By W. S. Robinson M. A. (London : Rivingtons). Price 2 s.

An excellent little volume forming Part III of the series. The book covers the period from 1603 to 1760 A. D. A nice book which is at once a history of England and a history of the manners, customs, literature &c. of the period. The style is simple and best suited for our school boys of lower classes, who should at any rate be recommended to read this book as one for their home study. The book is profusely illustrated. The printing &c are all that could be desired.

Elements of Mechanics. By George W. Parker M.A. (London : Longmans & Co.). Price 4s. 6d.

The book is best suited to students whose knowledge of mathematics is limited to elementary geometry, the solution of simple quadratic equations and a few of the fundamental propositions in plane trigonometry. The arrangement is excellent. This book can be recommended for the use of Matric. students. Each section of the work is followed by numerous exercises, to which answers are provided.

Macaulay's Essay on Clive. Edited by Vincent A Smith (Oxford : Clarendon Press) Price 2s.

This book is specially interesting as it is the first of its kind coming as it does from the pen of an eminent authority on the History of India. Mr. Vincent Smith in the Introduction to the book (which is certainly a masterpiece of its kind) holds a searching examination of the details in the light of recent historical research and thereby enables the student to correct a number of errors which he has probably held for a long time. The notes are thoroughly up to date and the textual difficulties and allusions are explained in a very simple manner. Another noticeable feature is the spelling of the Indian names which is done with remarkable accuracy.

Carlyle's Heroes. Edited by P. C. Parr. (Oxford : Clarendon Press), Price 2s.

The editor has given a very exhaustive exposition of the life and teachings of Carlyle and has also shown the intimate relation of the work to the central idea of the author's creed. The Notes though not exhaustive are sufficient for the explanation of the numerous allusions.

SCIENCE NOTES AND OTHER INTERESTING MATTERS.

SCIENCE AND ADULTERATION.

The progress of Science has been utilised not only for the improvement of our food, but also for its adulteration. And year by year the latter seems to be more skilfully carried out, and more difficult of detection. Hence it seems well to draw attention to some simple tests for the purity of common articles of diet given in a recent issue of the "Scientific American." They can be carried out by any one, and if systematically practised, would probably do more to stamp out fraud than many Acts of Parliament and multitudes of food inspectors.

Who in these days knows whether he is eating butter or margarine, or what foreign substances he is getting in his coffee? Here are the simple tests recommended by the "Scientific American" as regards the former. Heat the supposed butter in a spoon over a spirit lamp. Good fresh butter boils quietly, forming a number of small foamy bubbles. Margarine, and most samples of made-up butter, crackle and splutter like green sticks in a fire. Or put the sample in a bottle with warm water to melt for 30 minutes. If the water becomes cloudy it is margarine, if it remains clear, it is butter.

A REMARKABLE GRAFT.

A paragraph in the papers announces that an American horticulturist has succeeded in grafting a tomato on a potato. As a matter of fact, however, this curious vegetable union was successfully

accomplished in England some 14 or 15 years ago by Mr. Sutton, of the well-known Reading firm. When a tomato shoot was grafted on a potato stock the compound plant bore potatoes underground and tomatoes above. When, however, a tomato plant was cut down and grafted with a potato shoot little green potatoes were produced in the axils of the leaves. In a French work on grafting, "L'Art de Greffer," it is also claimed that M. Baltet, jun., grafted a tomato on a potato. In the same work it is stated that M. Carriere had grafted the tomato on the Bittersweet or Woody Nightshade of hedges. It will be noted that potato, tomato, and nightshade are all species of *Solanum*.

SUGAR FROM THE ELM.

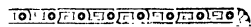
The sap of certain trees, as the Maple of America, normally contains a large amount of sugar. Other trees, it appears, may have their sap changed to sugar as an abnormal condition, a state of disease, in fact. And in a letter to "Nature" Mr. Gillet calls attention to a case of this kind occurring near Stratford-on-Avon. Three elm trees whose sap has thus been changed and exuded from the trunks have attracted great swarms of wasps. These have eagerly drained up the sap, and locally got the credit of having killed the trees. The trees look like dying, and another previously attacked in the same way died the next winter.

But the wasps, as another correspondent points out, have had nothing to do with the killing of the trees. The sweet sap which attracted the wasps was the outward sign that the trees were attacked by a disease known as "slime flux" which might easily prove fatal. The same thing has occurred this year at Kew, where a specimen of the small leaved elm has attracted numerous wasps and bluebottle to its sweet sap. The cause of this change in the sap is said to be a species of yeast which finds its way in by means of some wound, and sets up fermentation by which the starchy matter is changed to sugar. At Kew the elm beetle is thought to have facilitated the entry of the yeast. That the fermentation may proceed further,

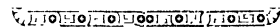
and produce a certain amount of alcohol, is indicated by the behaviour of the wasps, which says the writer of the note, "after feeding for some time, become stupid and lethargic."

HOW TO ROOT ROSE CUTTINGS.

The present time, says an English paper, is the proper time to take rose cuttings and nothing but the hardest wood is used. Soft, pithy branches are discarded, and there are no other precautions necessary, except to trim off any leaves that may remain, and see that there is a bud or two well down towards the bottom of the cuttings. Such is the advice given by the "smallholders." The cuttings are usually made about one foot in length. The soil should be well worked up and of a sandy texture: the planting should take place after a rain when possible. The cuttings are usually planted four inches apart in the rows, and the rows themselves one foot apart, thereby giving room to cultivate the soil.



CUTTINGS.



Lord Rosebury on New Universities.

On the occasion of the Commemoration of the Joyful Union of the Universities Dundee and St. Andrews on the 15th September last, Lord Rosebury delivered a speech in the Gymnasium of the University College in the course of which he beautifully outlined the differences between old and new Universities. The following extract is timely when so many new Universities are being attempted in India:—

"I cannot imagine a union between Dundee and St. Andrews, I do not think we shall ever see any more Universities founded on the lines of St. Andrews, a secluded place chosen for its seclusion, where study may be pursued uninterrupted by the grosser joys and temptations of a great city. All Universities of the future will be situated in great industrial communities where the want of Universities is keenly felt and where the funds for founding them are most likely to be

discovered. I think, therefore, that we may regard the era of shrines of learning like St. Andrews as past. It is wise, then, when a University of a new kind is found at a great centre of population, that it should try and unite itself to what is becoming so scarce—an ancient University and its traditions. Here in this union, you bring to each other what the other wants—St. Andrews as a retreat for study, with its matchless traditions, its ancient bulidings, its history and its renown, as a glorious centre in which a new University like this, representing its practical and industrial spirit of one of our great communities can best ally itself. I feel myself extremely fortunate in being allowed by the casual position of authority in the ancient University of St. Andrews to be brought once more to Dundee to see how well this union has prospered and how great is the development which may be hoped for from the University College of Dundee in connexion with its ancient foster-mother of St. Andrews. The Union is a blessing for both, and I regard it as an honour to come here to day to witness the first fruits of the Union, and do so for one reason which is egotistical. I have now served in the Rectorship of all the Universities of Scotland ; I have squared the circle. This is my fourth and last Rectorship. No wise man would ever undertake another Lord Rectorship. It is especially gratifying to me for many reasons that the very last stage of my manifested Rectorial career should be spent in the city of Dundee on this occasion."

SCIENCE AND EDUCATION.

The applications of scientific discoveries brought science into public prominence. Changes in the means of production, the establishment of factories and the consequent growth of great cities, changes in the means of communication by land, sea and air, changes in the methods of dealing with the problems of health, public and private, produced an immense change in mental and spiritual outlook. Man rules Nature by obeying her and to have any real dominion over her he must first discover and understand her laws. Naturally this affected men's views about education and brought

about a revolution. The improved social condition produced by science made popular education possible and gave birth to an educational revival. Higher education was weaned from the influence of classical tradition. The older extremely individualistic theories were undermined. The mutual interdependence of different men and different classes came to be recognised. The study of science was considered to be better suited than any other study to produce in the student just the right habit of mind to enable him to cope intelligently and effectively with the difficult problems of modern life. Attention was directed not only to the content of science but also to the inculcation of the scientific habit of mind. The method of laboratory teaching was introduced. The mind is thus brought directly into contact with fact and is trained to draw conclusions from premises surely established by immediate observation. All the improvements in educational methods which characterise the present day are due directly or indirectly to the influence of science. Now science claims the whole world for its sphere and so far from contenting itself with work in the laboratory, it goes out into the market place and into public life and seek to make its influence predominant in the world of business and of Government. It emphasises that the individual is not able to make the best of his life by his unaided efforts and urges a serious and organized effort to attack the complex problems of modern society in a scientific spirit and in the light of the best scientific knowledge. Hence, according to science, the true end of education is not individual knowledge or culture but social effectiveness. Hence the teaching of science must be made effective to this great end. This will make a heavy demand upon the teacher. His duty will not be so much to teach facts as to instil a scientific spirit. He can do this only when he is allowed to soar freely with a wide outlook before him. The foremost teacher will be the creator of the life that is to be, and as such must have a strong hold on the respect of the community.

—*The Educational Review.*

The Collegian.

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THE COLLEGIAN

An All-India Journal of Education.

NUMBER TWO, DECEMBER.

The Lieutenant Governor of the United Provinces accepted the proposals of the Committee appointed to consider the question whether the fees now charged in Anglo-vernacular schools are or are not adequate. The proposals of the Committee are in short the following :—(1) The fees of aided schools shall not be raised, and that the rules be altered so as to insure that no aided school shall be obliged to charge fees higher than those charged at present as a condition of receiving aid from Government. (2) That it is necessary to raise the fees in government schools and that classification of scholars for the purposes of fixing fees should be by standards instead of by classes. The actual scale of fees at present are : Upper primary (class III -/8/-, IV -/12/-), Lower Middle (V, 1/-/-, VI, 1/8/-) Upper Middle (VII 1/12/-, VIII 2/-/-), High (IX, 2/8/-, X 3/-/-). The scale proposes : Upper Primary (Re 1), Lower Middle (Rs 2/-/-), Upper Middle (Rs 3), High (Rs 5). (3) The Committee has made proposals that will afford sufficient assistance to poor and clever boys, by giving more concessions and scholarships. (4) Another proposal is the admission as half-free students in Government and aided schools of boys who are dependent on teachers who draw less than Rs 50 per mensem.

The report of the Director of Public Instruction for 1910-11 shows that the year saw an increase of

Bengal
Education
figures

900 educational institutions, and of about 43,000 pupils. Expenditure increased by about 10 lakhs, 79 per cent of which was contributed from public funds, and 92.1 per cent. from private sources, such as fees, subscriptions, etc. During the year 1910-11, 32.6 per cent of boys and 4.3 per cent. of girls of school-going age attended school as against 33.2 per cent of boys and 4.3 per cent of girls in the preceding year.

The number of secondary schools of all classes for Indian boys increased by 32 or 2.1 per cent, while the number of pupils attending them increased by 11,980, or 7.2 per cent.

The total expenditure on secondary schools for Indian boys amounted during the year to Rs. 30,26,044 as against Rs. 28,99,795 during the preceding year—an increase of about 4.4 per cent.

The number of *Primary schools* for boys increased by 233 and the pupils attending them by 5,362. The expenditure also on these schools increased by over half a lakh. The average cost of a primary school was Rs. 82.8 as against Rs. 81.9 in the previous year.

In the year under review the total number of pupils receiving primary education, whether in primary, secondary or other schools, was 1,343,786 against 1,312,778, in the year previous. One in every 6 children of school-going age was therefore, under primary instruction, the school-going population, as recorded by the late census, being 8,253, 501.

The total cost of imparting primary instruction was Rs. 55,41, 592 as against Rs. 49,35, 413 in the year before. This shows a substantial increase of Rs. 6,06,179 during the year under review ; 41.4 per cent of the total expenditure was met from public funds and 58 per cent from fees and private sources.

A terrible gas explosion took place in the laboratory of the Forman Christian College, Lahore, on the 19th instant. At about noon there was a tremendous report heard in that direction and instantly a portion of the

Terrible gas
Explosion in
a laboratory.

laboratory was seen in flames. It appears that the gas reservoir was leaking and escaping gas somehow ignited. Six persons, two of whom laboratory assistants, one a sweeper and his three boys who were playing near the site were frightfully burnt, bodies being mutilated almost beyond recognition. One of the assistants was lifted several feet high in the air. All the injured persons were immediately removed to the Mayo Hospital but all of them succumbed.

* *

The death of Prof. Chrystal, the author of the well-known "Treatise on Algebra" at the age of sixty, removes from us one of the most trusted of the pioneers of mathematical teaching.

After a brilliant undergraduate career at Aberdeen and at Cambridge, where in 1875 he was second wrangler, he became Professor of Mathematics at St. Andrews, and in 1879 he succeeded Prof. Kelland in the Edinburgh chair of that subject. He was an excellent teacher, and he introduced considerable reforms in the teaching of Mathematics.

* *

An interesting ceremony took place in Ludhiana on the 19th instant when Sir Louis Dane and Lady Dane opened five blocks of dormitories for students of the Medical School for Women. Rev. Dr. Wherry read the report, from which it appears that the number of students now on the rolls is 78 of whom 38 are taking the medical course, while 76 students have passed after obtaining certificates. The expenditure on the school and the Memorial Hospital amount to nearly half a lakh and is chiefly met by gifts from home.

Medical
School for
Women

Mr. Arthur Davies Secretary of the Madras Students' Advisory Committee draws attention to the following for the benefit of students who think of joining Oxford or Cambridge :

Madras
Students'
Advisory
Committee

'No Indian should dream of joining a College at either of these Universities unless he can command an income of at least £250 a year.

He will more probably find it necessary to spend £300 a year or even more. As a non-Collegiate student he may manage on less, but he will then probably miss the peculiar advantages that these Universities offer, and if he cannot afford to join a College, it would be well for him to consider whether he would not profit more in every way by going to one of the more modern Universities.

'The Colleges are sensitive corporate bodies with long and honourable traditions, and expect of those who have the privilege of joining them something of the same spirit of devotion that was rendered of old by the Hindu to his Guru. In particular the student's heart should be wholly set upon academical distinction, and in no way distracted by examinations outside the University curriculum. The utilitarian attitude that treats the College as a mere convenience destroys the value of Collegiate training and is rightly resented and discouraged.

'Admission to a College is a privilege which it is by no means easy even for English parents to obtain for their sons. Applications are frequently made three, four or even more years in advance ; and every year a number of applicants have to be refused'.

* *

In a recent issue *Punjab Gazette* it is notified that the children of agriculturists and villagers, Kamins, shall be exempt from payment

of admission and tuition fees in all primary classes except the upper primary classes of anglo-vernacular schools, in which half rates shall be levied. The children of parents who are too poor to pay fees may be exempted from payment of fees up to the limit in primary classes of ten per cent, and in secondary schools of five per cent, of the total number of rolls in each case. The children of teachers employed in recognised schools whose salary does not exceed Rs. 30 per mensem shall be exempt from payment of fees in vernacular schools and departments. Scholarship holders should not as a rule be exempted from payment of fees.

School fees in
the Punjab.

CALCUTTA UNIVERSITY

His Excellency the Chancellor of the Calcutta University is pleased to direct that two Election of Fellows Ordinary Fellows shall be elected this year by the Registered Graduates of the Calcutta University from among themselves.

The election will take place at the Senate House, College Square, on Saturday, the 3rd of February, 1912.

No person, unless his name has been entered in the Register of Graduates and unless he has paid his fee for the year, will be qualified to vote or to stand as a candidate for election.

Changes in Regulations The following changes in the Regulations of the Calcutta University, which have been adopted by the Senate and approved by the Government of India, are announced for general information :—

(a) In section 2, Chapter XLIV of the University Regulations for the words "and a fee of Rs. 10" in the second sentence have been substituted the words "and a fee of Rs. 25"

(b) In section 2, Chapter XLV of the University Regulations for the words "and a fee of Rs. 15" in the second sentence have been substituted the words "and a fee of Rs. 30."

(c) In section 4, Chapter XLVI of the University Regulations the word "fifty" has been substituted for "thirty" and for "Rs. 20" at the end of the sentence has been substituted "Rs. 30."

The M. A. and M. Sc. Examinations in 1912 will be held on Monday, the 24th June 1912, and following days.

Applications and fees for admission to the above examinations must reach the office of the Registrar, Calcutta University, not later than the 25th March 1912.

The I. E., L. E. and B. E. Examinations in 1912, will be held on Monday, the 8th July 1912, and following days.

Applications and fees for admission to the aforesaid examinations must reach the University office not later than the 24th June 1912.

Text-Books In the list of text-books prescribed for the Matriculation in History for 1914, published at page 977, Part IC of the *Calcutta Gazette* of the 9th December 1911, for "M. Prothero—Primer of the History of India," read "M. Prothero and Vidyabhushan—Primer of the History of India."

The result of the next Matriculation Examination in the year 1912 being made known, the nine third grade junior scholarship allotted to the Bhagalpur Division will be distributed as follows :—Monghyr—2. Bhagalpur—2. Purnia and Darjeeling—2. Sonthal Parganas—3.

PUNJAB UNIVERSITY.

Law Principal At a meeting of the Law faculty held in the chambers of Sir Arthur Reid, Chief Court on the 27th November, Mr. Kanwar Sain M. A. (Punjab and Cantab) *Bar-at-law* was recommended to the Principalship of the Law College in place of the late Mr. Golaknath.

The Syndicate was requested by the Principal, Central Training College Lahore to revise the Regulations for the Degree of Bachelor of Teaching, so that Regulation No. 2 read :—The examination shall be open to any graduate of the Panjab or any recognized University, who, after passing the examination for the Degree of Bachelor in any Faculty (other than Oriental) has undergone a course of training for *one year* at a Training College for Teachers affiliated to the Panjab University."

The Syndicate approved of the proposal, but it was held that the amendment must be submitted to the Arts Faculty before it was circulated to Fellows for opinion.

The annual convocation came off on the 22nd instant Rev. Dr. Ewing the Vice Chancellor delivered the usual address. He touched on many salient points concerning the growth of University Education and the difficulties of actually putting many good methods into practice.

Annual Convocation Dec. 22

THE COLLEGES.

THE REPORT OF THE DIRECTOR OF PUBLIC INSTRUCTION FOR THE YEAR 1910-11, HAS THE FOLLOWING:

While the number of Arts colleges remained stationary, the number of students attending them increased by 1164. A feature of the year's working is that an increase of Rs. 1,04,371 is recorded under the head of fees, while the increase of expenditure from provincial revenues amounted to Rs. 46,117.

The Calcutta Mess Scheme cannot at best be regarded as any more than a makeshift arrangement. Happily, however, the matter has attracted the attention of the Government of India and after the close of year under review a considerable sum of money was placed at the disposal of the Government of Bengal for the provision of hostels for students.

The year is memorable for the great advance made with the extension scheme of the Presidency College. The main lines on which the project will proceed have been laid down and with the help of the special grant of Rs. 8,00,000 from the Government of India a substantial portion of the Committee's recommendations will soon be carried into practical effect. The new laboratory building for Physics, Physiology, Botany, and Geology will, it is hoped, be completed by July 1912.

The annual prize distribution was celebrated recently with the Hon'ble Mr. P. S. Sivaswamy Iyer, Advocate-General in the chair. After a series of interesting dialogues, recitations, and songs, the report of the Principal, which is the 22nd Annual Report in the annals of the Institution, was read and it showed marked progress in almost every direction. It was evident from the Report that the extensions of the college buildings which are being made under the new regulations of the Madras University have caused great expenditure all round. Religious and moral instruction received due attention. In the course of his report the Principal laid great stress on the necessity for funds which was keenly felt under the new regulations, and stated that according to those regulations an endowment calculated to yield an annual interest of Rs. 3,000, was necessary for the college.

The chairman in the course of a lengthy speech discussed the question of moral and religious instruction in regard to the proposed Hindu University. In conclusion, he hoped that the people of the Madura town and district would subscribe liberally and generously to the college funds, in a manner worthy of the ancient traditions of Madura which enjoyed the reputation of being the seat of learning from time immemorial.

Their Excellencies the Governor and Lady Lawley paid a visit on the 1st November to the Madras Sanskrit College. A large gathering of the friends and well-wishers of the Institution headed by the Hon'ble Mr. Justice Sundara Iyer and Mr. Ramaswamy Iyer welcomed Their Excellencies. Mr. Krishnaswamy Iyer introduced the Professors of the College to H. E. the Governor. An address was presented in Sanskrit to His Excellency and was read by one of the students of the College.

Mr. Justice Sundara Iyer, the President of the College Committee, then gave a short memorandum on the College, in the course of which we have the following:—

The annual expenditure of the College is at present about Rs. 6,400 of which the cost of the establishment including contingencies is about Rs. 3,400, and the expenditure on the hostel and stipends Rs. 3,000. The permanent funds of the institution amounting to Rs. 69,000 are made up of the following benefactions:— (1.) Rs. 45,000 given by the Hon'ble Mr. V. Krishnaswamy Iyer. (2.) Rs. 5,000 given by Mr. C. P. Ramaswami Iyer in memory of his father the late Mr. C. R. Pattabhirama Iyer. (3.) Rs. 19,000 given as already noted above by the executors of the estate of the late Mr. S. Swaminatha Sastri. Since 1907-1908 the Government are making an annual grant-in-aid of Rs. 1,000 towards the maintenance of the College. Since 1908-1909 Mr. A. Anniah Pandit of Mysore is making an annual contribution of Rs. 200 for the maintenance of two students.

His Excellency then presented diplomas to passed students of the College and made a long speech from which we extract the following:—

"I am very glad, ladies and gentlemen, that though on the very eve of my departure, I have been able to see for myself the work

in this College. I thank you all once again for your kind expression of goodwill to my wife and to myself, after we have reluctantly bid you good-bye, and I cordially hope that this College may flourish and prosper long after my name here is forgotten and buried in the dust heap of time."

We have just received a copy of the calendar of the Jaffna College, 1912. The following are the important items: the Board of Directors includes Mr. T. C. Changarapillai, J. P., U. P. M. as Chairman and Rev. L. B. Scott M. D. as Secretary. Rev. Giles G. Brown B.A. B. D. is the Principal assisted by Mr. Harry E. York Ph. D. the Vice-Principal. The first Term extends from Tuesday January 4th to Friday March 15th; followed by long Vacation. Second Term. 7th May to 12th July; 1st Short Vacation. Third Term—23rd July to 27th September; Second Short Vacation. Fourth Term—Oct. 8th. to Dec. 13th; Christmas Holidays up to January 6th.

For 1912 Jaffna College is prepared to offer four distinct courses of study, each aiming to provide for as many distinct needs. These four courses are designated the Classical, the Scientific, the General English, and the Business and Commercial Courses. The Classical course leads up to University Arts Matriculation, the Scientific course to University Science Matriculation, while the General English course offers a free choice for the selection of a general culture training with or without Latin. It also fits for the University, if it is so desired.

The Sikh graduates of the Punjab University have elected Sirdar Kharak Singh, Pleader, Lahore as their representative on the Amritsar Khalsa College Council in place of the late Sirdar Gurcharn Singh.

Mr. E. A. Wodehouse, Hony Secretary writes:—

The Central Hindu College anniversary will be celebrated on Tuesday, December 26th, at Benares. On the previous day, Monday, December 25th, there will be a meeting of the Cent-

ral Hindu College Old Boys' Association at 7 P. M. at which Mrs. Annie Besant, will preside. It is to be hoped that in view of the great field of usefulness opening up before the old boys of the institution in connection with the proposed Hindu university, there will be as large an attendance as possible on both these occasions. Invitations are being sent out to all those past students whose addresses can be ascertained; but it is hoped that others, whose names may have been left out, will take the opportunity of re-visiting their old college and helping, as their presence would undoubtedly do, to make the anniversary a success. The names of those who intend coming, should be sent before December 22 to E. A. Wodehouse, honorary secretary, Old Boys' Association, so that arrangements may be made for their stay.

TECHNICAL EDUCATION.

A NEW post that of Metallurgical and Analytical Inspector of Steel has been created under the Government of India, and the first holder of it, it is stated, will be Mr. Andrew McWilliam of Sheffield University. His services it is understood will be chiefly valuable at present in connection with the Tata Iron and Steel works, though he will doubtless be useful in other ways also as an expert adviser.

TECHNICAL EDUCATION IN BENGAL.

In the year under report, Central institute passed out its first batch of students from the higher class. Eighteen students appeared at the examination, of whom 12 passed—9 in the first class and 3 in the second. Six of the candidates found employment almost immediately, and of the remainder, two have purchased land with the view of starting a small hand-loom factory; others are willing to follow their example if funds can be raised for the purpose.

As regards the Artisan classes, the Principal observes that these have been chiefly manned by local weavers of Serampore, the number of weaving students sent by the district board having been very small. The majority of the students who passed out have turned the instruction they received at the institute to profitable account.

Two new centres have been opened during the year, so that in all there are three out-lying centres and a special weaving school at Sambalpur. Proposals have also been made for opening out fresh centres.

His Honor the Lieutenant-Governor of Bengal visited the institution during the year and was pleased to sanction a grant of Rs. 1,000 towards the nucleus of a library.

In the mining classes of the Sibpur Civil Engineering College there were 16 students at the beginning of the session: of these, 2 dropped out, leaving 8 in Course I and 6 in Course II. Five students were successful in gaining diplomas.

In accordance with the new arrangements sanctioned by Government, the Superintendent of Industries was appointed to the Secretaryship of the Mining Advisory Board, and mofussil mining classes were opened in four centres, namely, Sijua, Jharia, Charanpur, and Deshergarh.

At the sessional examination 50 per cent of the candidates passed. The examiners report that the classes are performing a very useful work in the coalfields.

Agricultural classes held in connection with certain high schools, were abolished last year.

'Nature study,' however, forms an important part of the curriculum in most schools, and a scheme for awarding medals and diplomas in that subject to pupils in training, middle, and primary schools is under consideration.

During the year under review Government approved of the revised syllabus for the Sub-Overseer and the Overseer courses and the new rules for the conduct of these examinations.

—From the Report of the Director of Public Instruction for 1910-11.

Taking the percentage of passes, the Bengal Veterinary College, of all such colleges in India, stands first, last year's results giving an average of 76.69 per cent.

EDUCATION ABROAD.

The subjects of discussion have now been announced for the Congress of the Universities of the Empire which is to be held in July of next year. Several points are of

great interest—as, for example, whether entrance examinations can be mutually recognized. The difficulty here is to fix a standard that will be acceptable to all Universities alike. But it ought not to be impossible; for University education should not begin until the student has had a sound training in the elements of several subjects. The possibility of the interchange of teachers will also be discussed; and the establishment of a Central University Bureau will be considered. Many of the Colonial Universities give instruction to students not proceeding to a degree to an extent unknown in England. The advisability of this course is included in the program. In order to help the Congress to understand the problem, we believe that the Board of Education have prepared a comparative statement of the facilities offered by each of the fifty-one Universities. In addition the Universities have been asked to prepare memoranda for the information of the Congress.

Out of the funds of the Bottinger Trust a German "Institute for Foreigners" is being established in Berlin. Planned on a larger scale than the existing *Studienhaus* at Gottingen, it is to serve as a centre of intellectual life for educated foreigners in the German capital. A strong staff of teachers under Direktor Prof. Dr. Wilhelm Paszkowski has been appointed. The necessary rooms are provided by the Prussian Education Department in the building of the new Royal Library. The scheme of instruction embraces courses in language (with practical exercises), lectures on the literature, culture, and institutions of Germany, debates, excursions, and so forth. As a rule, complete courses lasting two months must be taken. A course consists of from eighty to a hundred lessons, and the fee for it is 100 Mk.

Mc Gill University, Montreal, for the endowment of which one million and a half dollars have just been raised in three days, is the best known of Canadian Universities.

Mc Gill University
Canada. In its magnificently equipped physics laboratories was born the new science of radio-activity which has so completely revolutionised the scientific conception of matter. This was due to the brilliant work on radium emanations carried out ten years ago by Professor Rutherford, now Director of the Physical Laboratories at Manchester University. Thanks to the liberality of Sir William Macdonald, who gave McGill its Physics building, Professor Rutherford and Mr. Soddy, of Oxford, were enabled to investigate the mysteries of radium in a manner then impossible in any other laboratory, with the result that the revolutionary theory of radio-activity, at first regarded as a flight of the imagination, attained the position of an exact science in less than two years.

The Rectorial elections at Glasgow, Aberdeen, and Edinburgh took place on October 28. At Glasgow, Mr. Birrell was elected by a majority over Lord Charles Beresford in each of the four "nations." His majority on the aggregate vote was 195. At Edinburgh Lord Minto had a majority of 222 over Lord Crewe, and at Aberdeen Mr. Andrew Carnegie was elected unanimously. The students indulged in the usual pease-meal fights; but there were no incidents out of the common.

Statistics printed in New York show that the number of students who work their way through American universities tends rather to increase than decline; and there is confirmation also that the social status of the students is not handicapped, because in some cases—indeed, in most—the parents pay for their sons' education, and in others the boys pay for themselves. The students in one great university, Columbia, earned over £15,000 in the academic year, and they tried every form of employment imaginable, from secretarial work to bricklaying. Numbers of young men worked as waiters in hotels during the summer holidays, and some as bus conductors—a fact which, so far from stimulating the snob-

bishness "inherent in some boys with paying parents," seems rather to have had the reverse effect.

Columbia self-help students made one-half of the total earnings during the summer holidays. One man earned over £500 during the academic year. He was a senior, and made this big sum by acting as Press agent for an actress and by tutoring and writing librettos. Despite the success which attends self-help at the American universities, it is recommended by authorities that Freshmen, on entering, should have at least sufficient money to pay the first half-year's expenses, say £60. After the first year, providing a youngster has sufficient courage, endurance, and no stupid notions about pride, everything seems comparatively plain sailing.

In the list of successful candidates at the London M. D. Examination held in July 1911, published by the London University, we find the names of two Indian gentlemen, viz. Messrs. Phirozshaw Cooverij Bharucha B. S. and Manchershah Dhanjibhai Dorabji Gilder B. S.

MASS EDUCATION.

SPEECH BY MR. GOKHALE.*

As was observed by his Excellency Sir George Clarke, two years ago, when he presided over a similar function, there are certain features in the work of this Society which appeal strongly to all lovers of mass education in this country. In the first place, the work of this Society is to spread education among those classes that are the poorest, the most resourceless, the most neglected—the labouring classes of this vast city. Second, the education which this Society imparts is given free; and third, the work has been undertaken by those who have accepted the responsibility not for private profit or not because the responsibility has been thrust upon them by anyone, but from a genuine love of humanity and from the highest public spirit. We have been told that the Society has now been for 25 years in existence and that during that time it has been able to achieve steady and continuous progress. The Society began with about 64 pupils, and to-

* Delivered on the occasion of the annual prize distribution of the Schools of the Society for the Promotion of Education of the Masses, Bombay.

day it has charge of the education of about 600 pupils. Now those who have any experience of public work in this country will at once recognise that for a body like this Society to show much continuous and steady work for a quarter of a century is something of an achievement. In the case of proprietary or private venture schools there is always the motive for self interest to ensure continuity of progress. In the case of missionary institutions, or those started by persons who devote all their time and energy to the work through a love for the cause, there is that missionary spirit to ensure continuity of work and of success. But for a body so loosely held together as this Society—if I may use such an expression without offence—a body composed of earnest men no doubt, but of men who are busy all day with their own affairs and who can give only odd bits of time in their spare moments to this work—for such a body working without any considerable endowment, to have achieved this success is really something remarkable, for our experience in such matters is that most such bodies reach a period of stagnation and decay long before the 25th year is reached. I, therefore, think that this Society is entitled to our warmest congratulations on what it has been able to do and I also tender to it on your behalf and mine our warmest good wishes for its continued prosperity in the future. But the best way in which we can offer these congratulations and good wishes is by helping it to carry on its work with increased vigour and on a larger scale. The report that has just now been read by one of the secretaries tells us that the Society is in need of funds. If you look at the statement of accounts given at the end of the report, you will see that the Society, financially speaking is not very well off,

As a matter of fact, on comparing this year's report with some of the previous ones you will find that the financial position of the Society is showing signs of deterioration. I hope I am wrong, but that is the impression which has been left on my mind. Now in a city like Bombay, which is known for its wealth, its enlightenment and its sympathy for the poor, I do not think it should really be difficult to raise the money that the Society is in need of. As a matter of fact, the Society does not make any large demand. You will see from the report that the total recurring

expenditure of the Society at present is about Rs. 5,000 a year or about Rs. 400 per month. Now, that really is not a very large sum for a city like Bombay to find. I am glad to see that the trustees of that beneficent and monumental charity—the Nowroji Wadia Charity—have decided to give this Society Rs. 200 a month for the next three years; a small grant of Rs. 60 a month is received from the Schools Committee of the Municipality. The Millowners' Association too used to contribute till this year a sum of Rs. 500 a year, but I am sorry to learn that the grant was discontinued this year on the plea that times are not very prosperous with the mill industry. Now I would like to make one observation in connection with this. If Bombay is the wealthiest city in India, the greater part of the wealth is due to its mill industry. And I know that many of the millowners are personally very humane individuals, ready always to assist every good movement. I am quite sure therefore that an appeal earnestly addressed to them on behalf of this institution is bound to succeed. The Society is working in the interests of the labouring classes of the city. And Bombay millowners, who must be watching the course of events in other parts of world, cannot fail to see that not only their sense of justice but also their philanthropy should in the first instance be exercised towards institutions like this Society, which are working for the welfare of the classes that largely create their wealth. Therefore, I do hope that the Millowners' Association as a body or the millowners individually will not only restore the grant which has been withdrawn, but will make a larger grant than before to this Society. And I trust that the report for next year will show that the Society is in a better financial condition than this year.

One of the reports which was placed in my hands by Mr. D. G. Dalvi, one of the secretaries of this Society, says that the idea which impelled the promoters of this movement to start their first school, first called the poor boys' seminary, was that all national progress was really bound up with the question of mass education, that there would be no real national progress worth speaking of unless there was a universal diffusion of education among the masses of the people. With that proposition I am whole-heartedly in accord and I am glad that there are signi-

visible on all sides which go to show that this great truth—this profound truth—namely, that there can be no real national progress for our people without universal mass education—this great fundamental and profound truth is being realised in an ampler and ampler measure on all sides of us. During the last four or five years there has been a gratifying awakening in the matter not only among the public, but also on the part of Government, and I think we may now feel confident that the question of mass education is steadily approaching its solution. It is really a most remarkable circumstance that during the last six months no less than 50 important municipalities in the country have come forward to say that they are prepared to take up the question of mass education in real earnest and make primary education compulsory and free within their areas, if certain facilities are given to them. It is a matter of disappointment to me personally and to many others that the Bombay Municipality is unfortunately not likely to be of this number. But this must not discourage us. The Bombay Corporation, no doubt, occupies a foremost place among the local bodies of the country. But among institutions as among individuals, it is often the case that it is not those who stand foremost that take the first step in a new direction. And it not unfrequently happens that those who should lead and do not find themselves in the end are forced to follow. In considering this question of mass education there are two things which must be borne in mind by everyone interested in the question. In the first place, the uniform experience of the whole civilised world now is that there can be no vast diffusion of mass education in any land unless education is made compulsory and free. It is no use saying that Indian conditions are different; they are not different in this matter from those of other countries, for the experience I speak of is the result of our common human nature. If you persist in proceeding in India on other lines and want to make your experiments on this subject, you will find in the end that you are only engaged in prolonging the reign of ignorance on the land. If you really want a universal diffusion of education among the masses in this country, you must go and do what other countries have done, namely, legislate to make primary education for the masses compulsory and free.

For more than 50 years now, primary education has rested on a voluntary basis, and where are we to-day? Four villages out of every five in the country are still without a school; 94 per cent. of the people are unable to read and write; and seven children out of every eight are growing in ignorance and darkness and all the moral and material helplessness which comes of such ignorance and darkness. Now we cannot, we must not, allow this state of things to continue. Our conscience in this matter has been sleeping much too long. Take the City of Bombay. From the report of the committee appointed by the Corporation about three years ago, to consider this question, we find that the school-going population of this city for purposes of primary education may be put down at about a hundred thousand. Of these only about one-third are under any kind of instruction in municipal, aided, unaided and even unrecognised schools. Two-thirds of this mass of children have yet to be reached and that, in a city like Bombay, which congratulates itself so often on its wealth, its enlightenment and its public spirit. If things continue to rest on a voluntary basis, it will require not only years, or decades but centuries, before the children of this country start their careers in life with the same educational advantages as those of other civilised lands. I, therefore, say that we must have compulsory and free education in India and that we must lose no more time in making a beginning in the matter. In this connection, I must say a word about a suggestion which often comes from certain quarters, namely, that primary education is not worth imparting unless it is best that can be given by trained teachers with proper appliances and in properly constructed school-houses. Such a suggestion, however constructive it may be in appearance, is really far more destructive than constructive. The first object of primary education is to remove illiteracy, and for this purpose almost any education is better than no education. I am glad to see a recognition of this in a recent resolution issued by the Government of Bombay on rural schools last year. The view of the Government seemed to be that an extension of primary education was not worth attempting unless its quality was ensured to be of a high order. In this year's resolution on rural education however, the Bombay Government express

their readiness to entrust primary education in villages to the old type of untrained teachers, thus recognising the soundness of the view that the first object of mass education is the removal of illiteracy. One more point I would like to urge on your attention on this subject, and it is this, that all over the world, in every civilised country, the burden of primary education is divided between the central Government and the local bodies. There has at times been a tendency in this country on the part of the Government to say that this burden should be borne entirely or almost entirely by local bodies, and there is also a tendency sometimes on the part of local bodies to say that the burden should be borne by the central Government. This really indicates a reluctance on the part of both, the Government and the local bodies, to do their proper duty in the matter, and the only way in which both can be made to move as they should is by the pressure of public opinion being brought to bear on them. Unfortunately, our public opinion is not sufficiently articulate, insistent, or persevering or even well informed.

Our first duty, therefore, is to educate the public opinion of the country, and having educated it to organise it and to bring it to bear on those who are in authority, whether in the central Government or in local bodies. It is well to remember that local bodies require at times the pressure of public opinion no less than the central Government, for a tendency to move in fixed grooves goes with all exercise of authority, local or central. And I am convinced that if only we are earnest and persistent enough in this matter, success is bound to be ours. Every feeling of justice, every sentiment of humanity must impel us to press forward with this question. 94 per cent. of our people should be sunk in ignorance, superstition and squalor. I can think of no injustice more cruel or monstrous than this. Even on the lower plane of self-interest, how can there be any real progress for our people with 94 per cent. of our people unable to understand what progress means? And how can a nation be evolved out of such material? Therefore, if we are in earnest about national progress, and if we recognise the dictates of injustice and of humanity, this is the one question of all questions to which we must direct our energies at the present moment, the question of mass education in

the land. If we take up the question in the right spirit and persevere with it as we should we shall have ensured the future of our country. If, on the other hand, we continue to neglect it, as we have been doing all these years, we may talk of national progress as much as we choose, we shall not be able to achieve it till the crack of doom.

SCIENCE AND PHILOSOPHY.

CHAPTER I.—INTRODUCTION.

There was a time when the Scientists thought it proper to pass some judgments on the question of being of God—
 Phys- and Meta- physics. they thought they had a right to do so. There was no hard and fast line of demarkation between Natural Science and Metaphysics; then the sphere of physics was not separated from that of metaphysics—they were blended together under the one name of philosophy. Though Wolf endeavoured to draw a line of demarkation between knowledge, empirical and rational, yet the distinction was not fully recognised until recent times. Now the Scientists do not feel it their duty, as Newton did at one time, to give any opinion on the problems of Metaphysics and Theology. But because they reserve their opinions on such problems we must not think that their private opinions are negative. Paley thinks that an examination of the eye is a cure for atheism, while Helmholtz who certainly knew more about the eye than half a dozen Paleys describes it as an instrument which every scientist would be ashamed to produce. But because Helmholtz finds such serious fault in the mechanical construction of the eye, should we suppose him to be an atheist and as a matter of fact he was not an atheist. Progress of scientific knowledge does not sap the foundation of religious belief but rather strengthens it and sanctifies it. Of course books like that of Paley are not in much repute now for, things assumed inexplicable without God have been explained by later sciences. Still there are many things which science cannot explain. Science cannot explain the ultimate beginning of all things, nor can it explain the ultimate end of things beyond experience; it cannot even explain the gaps in things within experience; it cannot bridge over the

gap between the inorganic and the organic world. Bacteriology has disproved the theory of spontaneous generation—the production of life from matter. Science cannot explain the gap between mind and organism; it cannot explain how rational mind can come out of what is non-rational. But as to the relation of mind and body science has to assume some such theory as the theory of parallelism has to assume the concomitance of the mental and physical processes; but it is an assumption only—no explanation is given by science of the correspondence and connection between the mental series and the physical series. The theory of parallelism supposes that psychical and physiological processes are but two ways of expressing the same thing—it does not suppose that there are two substances or that the two kinds of processes act on each other causally. Science only determines the facts of concomitance that exist between mind and body; it determines what physical processes correspond to what psychical ones, how mind and organism develop *pari passu* and so on. Science explains the facts of correspondence existing between the physical series and the psychical, but why this correspondence, this concomitance—this is a question which it does not explain, nay, it altogether abandons such question. The sphere of science is said to be the physical world which is a complete whole. Science deals with the physical world only, takes it to be as it seems to us and thinks it to be independent. What then is its attitude with regard to mind? It is only an occasional phenomenon, it appears only here and there, it has no independence of its own, it depends on nature and through its medium it is connected with other minds and hence mind is only a natural product subject to natural laws. This view in the seventeenth century was called Naturalism. But is not nature itself unknowable? It is in terms of our own consciousness that we know nature. Hence the conclusion that mind is the product of nature is unwarranted. But can we not say for the same reason that mind itself is unknown, for, it is known only in terms of consciousness—it is that which has the conscious states? Thus naturalism gives place to agnosticism by which certitude of knowledge is declared impossible. Kant, of course tried to solve the difficulty by his theory of *a priori* forms and categories of thought; but science

asserts that these *a priori* forms themselves are products of nature, yet it says at the same time that the nature of things is unknowable. Thus we see that naturalism gives rise to agnosticism and agnostic naturalism destroys itself. Spencer, however, holds, as we have seen, a double position—metaphysical things and the absolute do really exist but they are unknown and unknowable. But if they are unknown and unknowable, how does Spencer come to know that they have real existence? According to Lewis however, Positivism, which limits itself to experienced facts, has, for the first time, given a true consistent explanation of the world, man and society. This Natural and Empirical Theory has three forms: The Mechanical Theory which is assumed in and is the basis of all others; the Theory of Evolution which explains the origin of the present universe in terms of the Mechanical Theory; and the Theory of Psychological Parallelism which tries to meet the difficulty of the relation of mind and matter. We should now proceed to examine these scientific theories of the world in the light of Philosophy.

CHAPTER II.

THE MECHANICAL THEORY OF THE WORLD.

Laplace holds that a thing cannot begin without a cause, therefore, the present state of the universe is the effect of the preceding and the cause of the succeeding state and that all changes take place according to strictly natural laws. Hence the intelligence which could see the whole condition of the universe at any one moment, would see its whole future as well as its past. Thus according to Laplace, God is a mere mathematical calculator. But Newton, on the other hand, holds that every thing here manifests the presence of a wise and powerful author. "The various portions of the world, organic and inorganic, can be the effect of nothing else than the wisdom of an everliving powerful agent, who being in all places can move the body within his boundless sensorium and thereby form and reform the parts of the universe, more easily than we, by our will, can move the parts of our own bodies." Thus we see that there are two

different theories of the universe—The Laplacean Mechanical Theory, the theory of automatic mechanism which supposes that the laws of nature are essentially forces inherent in nature; and the Newtonian Theistic Theory, the theory of an omnipresent divine power, who governs the universe and knows everything in it not by cold mathematical calculation but by immediate intuition. But the Newtonian theory, admitting the presence of second causes that God at the time of creation implanted forces in nature and left them going, reduces itself practically to the Laplacean Mechanical Theory; for, the supplementary theory of that occasional interference (miracles) of God has been gradually exploded. Hence the theistic argument became mainly this: though the world is a machine, working by itself, yet we must look up to God as its creator and collocator (Chalmers.) God is the first cause of matter and its laws which after creation became independent second causes. This is the deistic position as it is termed by Martineau. But this deism leads naturally to materialism—God being dispensed with from within the world is easily dispensed with from its beginning matter and its laws being supposed to be eternal and to have made their own collocations; or it may lead to Pantheism God being supposed to be all and everything in his manifestation. As a matter of fact, modern naturalism is due to the deistic form of theism, from which it is only a step forward.

The Newtonian
Theory

The Laplacean or purely mechanical theory is mathematical and therefore abstract, for, mathematics neither knows the ultimate atoms nor how they unite to form concrete wholes—it deals with things in an abstract way from certain aspects only and it ignores their concrete reality together with the corresponding ideas of substance, causality &c. Kirchhoff, Macpherson and others also insist on the banishment from science altogether of the ideas of causality and force and think such ideas as purely metaphysical fictions or fetiches. According to them what remains is only mass and motion and force has no independent existence but it merely represents the rate and direction of

Mathematical mechanics.
Abstract Dynamics

the mass in motion. Pure mathematics deals with a hypothetical world of abstract forms and motion and has, therefore, no application to the concrete world of reality. Time, space and motion, for instance, are supposed to be absolute, existing by themselves and unrelated to other things. Now how to connect this mathematical world of absolute motion and forms with the concrete world of reality in which everything is relative? In the real world position in space implies the relation of things to one another and to a perceiving mind, but conception of absolute space excludes the idea of any connection between things. Nor can we conceive absolute motion or absolute time, for, the former implies direction, degree, speed &c. which must be relative to something and the latter implies change, but how can there be change in absolute time? Newton, however, supposes an absolutely immovable body in absolute space from which the movement and position of other bodies may be measured, but such a body is unknown and contradicts the notion of absolute space and position. Such a world of absolute and unrelated things is inconceivable and even granting it conceivable we cannot identify it with the concrete world of related things. In order to identify the abstract mathematical world of Laplace with the real world of experience, Spencer identifies the conservation of mathematical mass and motion with the indestructibility of matter in the concrete world; but is conservation of mass and motion the same thing as indestructibility of matter? Kelvin tries to bridge over the gulf by his hydro-kinetic theory. He holds that space is filled with ether and atoms are but eddies on the whirlpool of the mobile fluid. Thus having derived matter from conditions to which mathematics is applicable, he applies its principle to explain the concrete world.

The hydro-kinetic theory reduces matter to a mode of motion. There are two hypotheses as regards the constitution of matter—that it is infinitely divisible and that there are ultimate indivisible particles, atoms. The physical science assumes that the atoms are all moving or tending to move always except in so far as they are impeded by other moving atoms striking against them according to mechanical laws, and that the same laws of mechanics apply to the smallest as well as to the largest

Molecular Mechanics

aggregate of atoms—to the stars and planets as well as to molecules. Thus the mechanical theory reduces all qualitative properties *viz.* colour, light, heat, electricity &c. to relations of quantity *viz.* to mass and motion of atoms.

The whole universe consists of infinite atoms of about 70 different elements and the atoms of each element are identical in their properties. These atoms by their juxtaposition go to make up the universe and they remain unchangeable although they disintegrate and rearrange themselves. Graham's experiment of the dialysis of gases by means of membranes may show that the atoms of each element are identical in their properties and are unchangeable, yet recent Spectroscopic analysis reveals in some stars the existence of a uniform gas while in others of more complex and denser gases. Is it to be supposed, in the latter case, that the gases themselves and therefore their atoms have undergone transformation? The molecular theory however assumes that there has been no change in the atoms themselves, they have only combined to form complex compounds—the structure has changed but the bricks have remained the same.

The molecular theory, however, cannot by itself explain everything; it cannot explain, for instance, the phenomenon of light; hence it has to be supplemented by the theory of ether. But what is ether? Is it composed of an infinitely fine kind of gas? Is it perfectly non-molecule? Is it perfect fluid or rather solid with an infinite capacity of vibration? But these hypotheses, holds J. S. Mill, are purely imaginary and may be due to the overzealousness of physicists like Kelvin and Maxwell to explain everything by mechanical analogy. But the question is: Is the world really this sort of mechanical machinery or is it a convenient way of representing the world which in its essence is entirely different?

There are various mechanical theories of matter *e.g.* the purely mechanical Atomic Theory of Democritus which holds that atoms are absolutely hard, indivisible, indestructible and unchangeable. But these bodies being nelastic will not rebound when they strike each other and part of their force will be lost and many phenomena will remain unexplained, and moreover, no influence can

be exerted by one body upon another without contact; how can then gravitation be explained which supposes action at a distance? Newton saw the difficulty and left open the question whether gravitation acts through empty space or in some other way.

The above difficulty leads to a modification of the theory—the atoms are no longer space-filling particles but are reduced to unextended centres of force acting from movable points in space. Atoms being thus points endowed with power of attracting and repelling others according to fixed laws, substance is done away with or what is still worse force is substantialised. Faraday, though, a follower of the above theory was afterwards led by his researches in magnetism to a different theory. He saw that magnetism cannot act through empty space which is, therefore, according to him, filled with an ethereal fluid subject to electromagnetic action. Then Lord Kelvin showed that the ethereal medium under the influence of magnetic force must be in a state of rotation—small portions of the medium will rotate each on its own axis; and Helmholtz having shown that vortex rings in perfect fluid are ever lasting, Lord Kelvin introduced his theory of atoms as vortex rings. What are the properties of these atoms as vortex rings? The perfect fluid and therefore its eddies have inertia, density, and perfect mobility, so that they will preserve their essential form and motion eternally. But there are difficulties in the theory of ether and vortex rings: Would vortices or motion of any kind be possible in a perfect liquid? How can motion even be possible without a solid resisting ground from which the motion is set going? How can matter come out of what is not matter? How to account for gravitation, resistance and all that by means of what practically possesses none of these properties? How to account for the origin of the vortex rings themselves? Are they self-existent? They are supposed to be created at a certain point of time and hence we have to fall back again upon the crude theory of Deism and miraculous creation. This theory does not agree with the doctrine of relativity, for, we fail to distinguish such a medium as the theory supposes from mere nothing. In short the whole system is based upon fancy and hypothesis which does not agree with facts and is full of self-contradiction.

The mathematical and mechanical view of the world takes things as if their only attributes are form and mass. But even in the mathematical view there is the idea of motion which involves the idea of energy which in later theory is made the starting point and applied to explain the world conceived as a heap of energies. Matter is known only by feeling of resistance and resistance is force so that objectively the world is a system of forces of which muscle-feeling is the subjective aspect. The old theory was that energy is the life of inert, passive and unchangable matter—something put into it from outside. It is a crude theory which supposes matter without force and force without matter to have independent existences at the beginning; moreover, in this case, their combination remains inexplicable. Descartes holds the dualism of matter and force which he conceives as put into matter by God. The difficulty of explaining the substance of matter without force was perceived by Liebnitz who, therefore, said that force is the very substance of matter.

We know matter only by the effects it produces; but the production of effects is energy. The effects are the manifestations of force or energy, or in other words, we know nothing of matter beyond its energy. Thus we see that substance is known in terms of energy which therefore is its essence and not something put into it from outside as the mechanical theory assumes. Thus from the dualism of matter and its life, energy, we pass into the stage in which everything is resolved into modes of energy. This tendency viz, to express all things in terms of energy, has been kept by recent discoveries by chemists of forces other than purely mechanical. Both Descartes and Kant thought that the mechanical was the only scientific explanation, the theory of living matter being opposed to science; now, however, the scientists recognise that at least some forces cannot be so explained and there is a tendency to regard matter as something other than mere modes of energy. But if matter be reduced to energy conservation of mass would mean conservation of energy; and as we can measure only the quantity of energy, the ultimate nature and quality of different forms of energy would remain still unknown. The mechanical

theory however resolves all energy into one kind viz that of motion, so that difference in quality means difference in degree of motion, and impact. But as quantity supposes its antecedent quality and therefore mechanics which deals only with quantity cannot reach the innermost nature of things, their quality. Moreover, though Helmholtz and Tait inferred the conservation of motion from the transference of motion from one thing to another which is thus never lost, yet Mayer, the founder of the theory did not mean that the only form of energy we know is motion and impact, on the other hand he deduced the theory a priori from the principle "the effect must always be equal to the cause." The mechanical theory however has yet failed to reduce the work of mind into a mode of motion so that it must either accept the dualism of matter and mind or treat mind as an accidental by-product or admit the theory of parallelism. On the other hand, if matter and mechanism be mere phenomena as Kant supposes, of something unknown then also the mechanical theory fails for it does not explain the nature of the ultimate reality.

CHAPTER III.

THEORY OF EVOLUTION.

The naturalistic philosophy holds that nature is a vast mechanism, working according to the laws of evolution. But the mechanical theory of evolution by fortuitous variation and natural selection must be distinguished from the teleological in which an intelligence is supposed to lead the world towards its end. Spencer's theory is that of mechanical evolution by random play of mechanical forces. Although evolution commonly suggests the gradual unfolding of a being, making actual what was potential in it, in short, realisation of a pre-conceived end, yet the idea of an end is rejected by scientists who regard evolution as the process through which the present universe has come out of its primal state by the spontaneous rearrangement and distribution of its particles; and when evolution is complete, it will be followed by corresponding devolution out of which will arise a new evolution. This is supposed to be the theory of Spencer and he is accused, perhaps unjustly, of reviving the ancient Greek theory of Cycles,

But Spencer's theory is that evolution and devolution will be simultaneously going on in different parts of the universe. To say that Spencer supposes that there are two co-relative processes of nature—evolution from and dissolution into its original elements—is to accuse him further of assuming the universe to be finite. The universe may not be finite and hence cannot be treated as a whole so that we cannot say of it that after its evolution will follow dissolution, for, evolution and dissolution cannot rightly be predicated of an infinite universe. But does Spencer really assume that the world is finite? What he says is that evolution and devolution will be simultaneously going on in different parts of the universe balancing each other. Dr. Ward criticises Spencer on the supposed assumption and says that, as the watch when it runs out, cannot set itself going again, so when evolution has exhausted itself and the world has fallen back by dissolution into its original state, it cannot begin a new process of evolution of itself. Earth by devolution or dissolution must become an inert mass. For when things in movement strike against one another part of their energy disappears as heat and they are reduced to a more or less state of rest and loss of motion will be the result, for, the resolution of all motion into heat which will dissipate equally over all parts of the universe will bring about a state of equilibrium. But the difficulty of the theory that the whole energy of the world will be dissipated in infinite time and bring about a state of stagnation, is unsolved. What more, then, is necessary to renew the life of the universe after energy has been dissipated? It cannot be any new mechanical force for, that also, in its turn, will exhaust itself. The only way of accounting for a new beginning is by supposing a living intelligent mind power in the universe which directs the course of the forces, prevents it from running down and thus keeps up a perpetual motion in the universe, for, we see that only mind has the power of setting forces working and changing their direction. The mechanical theory of evolution fails to explain the primitive collocation of matter and the renewal of a new collocation after the former has run down. It is fallacious to think that mechanical Laws can explain everything, simply because they are seen to operate everywhere.

Spencer supposes that at first matter was in a state of disintegration and motion; the primitive state was perfectly homogeneous and the most unstable; a change took place towards heterogeneity in which state it is more stable; the original motion which was also homogeneous became complex and heterogeneous. Evolution is an integration of matter and concomitant dissipation of motion during which matter passes from an indefinite incoherent homogeneity to a definite coherent heterogeneity; and during which the retained motion undergoes a parallel transformation. But what is this primitive homogeneous state of matter? Spencer does not go further back than the supposed nebulous state of matter. Astronomers have found glowing nebulous masses in the sky in an intense state of agitation—matter in a very attenuated condition and Spencer assumes that the substance of the solar system was originally a nebula which gradually evolved into suns and planets and living beings by means of forces inherent in itself. But how has this change taken place? Spencer holds that the primitive nebulous state of matter was unstable and more liable to change than a differentiated state. But the analogy is rather against this for we find plants and animals which are no doubt more complex than the solar system decay immediately as it were when compared with the permanency of the solar system or the nebular mass. Hence the explanation that change to heterogeneity takes place because of the tendency of unstable primal nebula to gain stability is not satisfactory because it does not tally with facts. There are other difficulties too. What is the cause of the original state of matter? Why should the nebulous state be ultimate? What is the source of the agitation? How did collocation take place?—All these questions are left unanswered. Spencer further assumes that primitive nebula was full of force which though at present has undergone change still persists and has not been lost. But how did the matter of the original nebula get its force? The substance of the nebula is supposed to have been in a state of intense heat and heat, we know, is a mode of motion which by overcoming gravitation tears the particles of matter asunder. But the logical conclusion of the theory of primitive heat is that gradually the

Spencer's interpretation of evolution.

heat would radiate and the particles coming together under the influence of gravitation would form the stars and planets revolving round one another, the repulsive force of heat being still operative; but finally all heat must be dissipated in space and the massing together of all the planets and stars in one dead heap will be the result. Spencer to avoid this conclusion holds that when two solid bodies dash together by gravitation, the gravitating force is converted into new heat force and the new heat thus produced dissipates their substance again into liquid and gaseous forms and thus form a new nebula which again will develop into a new world of sun and planets. But this process of evolution and devolution cannot go on eternally for bodies will become more and more concentrated and collision less and less frequent and hence there will come a time when all matter will have concentrated into one mass and all motion and life at an end. Thus the mechanical theory ends in absurdity. Gravitation is assumed in this theory but not accounted for. Spencer's whole theory is based on the theory of the persistence of force, but what warrant have we in assuming this in the mechanical sense i. e. all energy is motion and tendency to motion? Spencer thinks it self-evident. If so, why was it not evident to people before it was introduced by Mayer, Joule and Helmholtz; why was it so late in being discovered and why did it need so much labour to demonstrate it and establish it? The truth is that it is not so self-evident as Spencer thinks. Moreover it may be asked: Why should the primary homogeneous state be unstable? It is cited that the mere homogeneous egg develops into more heterogeneous chicken; but why does it? Then, again Spencer's argument that effect must be more complex than cause is not conclusive for we do not know exactly how many causes operate to produce a given result. But the greatest difficulty of the system is to account for the order and adaptation seen in evolution. How can they be explained without teleology, without supposing the existence of a supreme mind directing the course of nature?

Spencer borrows his theories of Relativity, unknowable and unconditioned from Hamilton; of Conservation of Energy from Mayer, Joule and Grove; of Evolution from

Lamarck; and his Nebular Hypothesis from Laplace. Before Spencer the idea of evolution had been applied only to the particular department of the universe but Spencer extended in detail to the whole universe—inorganic organic and mental and tried to explain how life and mind and society developed from a primitive nebula. But it must be admitted at the same time that the idea of applying the doctrine of evolution to the universe as a whole had been suggested by Kant and Laplace before Spencer.

Spencer derives life, mind, society, and everything from integration and disintegration of matter and motion as contained in the primitive nebula and at the same time he says that this development has been progressive and what we now see was contained potentially in the original nebula. But there was originally nothing in the nebula but atoms in the state of intense agitation and to say at the same time that life and mind were potentially contained in the glowing particles of matter is the crudest form of materialism. How could life and mind have arisen out of the glowing particles? Spencer's answer is unsatisfactory. He says that matter or mind is in itself unknown but we have reason to believe that matter and mind are phenomena of the same substance also unknown and unknowable and we have no right to deny that life and mind may not be contained potentially in what appears to us as a fiery nebula. This, then, is the agnostic or rather Semi-materialistic phenomenalism—matter we know only through sensations, in itself it may contain, as Tyndall says "the promise and potency of all forms of being." Spencer's position is, however, contradictory; he derives the organic world from the inorganic which did not contain it; again organic world cannot be said to be the cause of life, nor life of mind. From matter and motion nothing but matter and motion can come out. Spencer commits the fallacy of compounding abstraction with analysis when instead of resolving the world into all its constituents, he abstracts only some of them viz matter and motion and thinks them to be all whereas in reality there are other things also in the universe, viz mind and life which cannot be contained in the primitive nebula. It is not probable that the beauty and order of the universe has been produced

Spencer's eclecticism
and originality

by chance and even if it can be so conceived we cannot think that matter and motion combined to produce life and mind which comprehends matter and motion—they can produce at least only the physical world. Of the various constituents of the world, Spencer accepts matter and motion, yet, afterwards he introduces life and mind and tries to impress that these latter are due to the continuous development of the former, but he himself admits that though there is a continuous transition, he has not explained it, and is not this admission a sufficient refutation of his theory?

Whence did living organisms, plants

Biological Evolution.

and animals, take their birth?

The oldest and commonest way of explaining it was by the theory of "Special creations". God created all the existent species and told them to multiply. The present theory, however, is that the present species have in the course of ages developed from lower forms of life which again was due to the modification of still simpler forms, the ultimate source being a few homogeneous particles of living protoplasm. How did the original particles of protoplasm originate? Did God create them and thereafter left them to develop themselves? Darwin admits that the first cells were created and endowed with life and then they went on developing. It is possible to go a step further and to hold that the living protoplasm is the developed form of inanimate matter and this is what Spencer means by saying that evolution is universal and continuous. He assumes a continuous progress from inanimate to animate but what made inorganic matter change into living protoplasm and these develop into lower forms of life and these into higher? It is now generally believed that the lowest form of life, the protista, is neither animal nor plant, has two branches, one feeding on organic substance, called protozoa and the other on inorganic substance, called protophyta—the latter develops into plants and the former into animals.

But even granting that living creatures originate of evolution, still different theories

Different Theories of evolution.

are possible of evolution.

It may be said that God had designed and planned every thing and has guided the natural forces in bringing them about—this is Theistic Evolution, evolution by will and design (Marti-

neau); it may be said that the guiding idea is present in the organism and works itself out unconsciously—this is Pantheistic Evolution—Fichte, Schelling, Schopenhauer, Hegel &c.; or it may be said that innumerable combinations are produced fortuitously by physical forces of which the fittest survive and these in their turn form newer and more complex combinations and so on. Lamarck holds that the variations though fortuitous are controlled by external forces acting on the organism which reacts for self-preservation. The Lamarckian theory is less purely mechanical, for, there is a psychical factor in evolution meaning thereby that action of the environment stimulates a feeling of want in the organism in striving to overcome which it develops itself. The Darwinian theory, however, is purely mechanical, it leaves everything to the fortuitous interaction of physical forces. Darwin accepted afterwards the Lamarckian theory to supplement his own.

There are however difficulties in the way

of reducing the biological
Principal difficulties involved in the theory.

to physical forces. Physical

and organic forces are in

their nature opposed to one another, the former tending to dissipate and bring about stagnation and the latter tending to concentrate and produce activity. Hence the physical forces being essentially different from the organic, one having katabolic tendency and another anabolic, cannot give rise to them. Again the wonderful adaptation in the world, everything serving as a means towards some end, cannot be explained by pure mechanism. Moreover there are certain features in plants and animals which apparently serve no useful purpose, e.g. the spots on the leopard's skin, and neither teleology, because of the absence of end, nor mechanism, because of its assumption that the useful only survives, can explain them. The older writers thought that the wonderful adaptation was due to the controlling influence of "vital force" over physical forces, but the present theory is that life is not a special force in this sense, were it so, then the transformation of physical forces would have always produced physical forces but never produced life. Ward is of opinion that the adaptation is due to the presence in the living organism even in its lowest form viz. protista of certain feeling or unconscious ideation which directs its development along certain channels. Organisms

evolve in accordance with subconscious thought operating within them ; they adapt themselves to circumstances without so much of struggle against one another as Darwin and Spencer hold. Ward thus agrees with the ancient Greeks, Pythagoras Anaxagoras, Plato and Aristotle and with the modern philosophers Fichte, Schelling, Hegel &c. With Ward what we call life is only an unconscious state of mind.

(To be continued).

C. C. SINHA.

WHAT IS ECONOMICS?

The old classical-school of Economics defined Political Economy as a Science of the phenomena of wealth—as a Science which deals with the production, consumption, distribution and exchange of wealth.

The old definition and its criticism

This definition has the characteristic merits of preciseness and simplicity ; but it has, however, the drawback of turning attention away from the real subject of Economics, which is *man and his wants*. It concentrates attention on *wealth* alone which is only a means for the satisfaction of human wants. It supposes as though man were made for wealth and not wealth for man.

These flaws in the old definition of Political Economy did not escape the eye of the critics like Carlyle and Ruskin who severely criticised Political Economy on the score of their belief that it regards man as absolutely absorbed in the selfish pursuit of wealth.

Hence they variously termed Pol. Econ. as the “dark science,” the “dismal science,” the science of Mammon and so forth. But these critics, however, could not view Economics in true light. They overlooked the fact that though money or the general purchasing power is the centre around which Economic science clustres, this is so not because money is regarded as the main aim of human effort, but because money in this world is the one convenient means of measuring human motives on a large scale.

In contradiction to the above definition of Pol.

Econ. there is the new definition of it as a *branch of the Science of Sociology*, the idea of which

The new definition was started by Auguste Comte. Sociology consists of a group of social sciences that deal with the various relations that unite men socially. As there are among men many kinds of social relation—moral, legal, economic, political, religious and linguistic,—so there are many kinds of distinct social sciences known as Ethics, Law, Political Economy, Politics, the science of religion and the science of language.

Thus we see that Pol. Econ. has been included in the broader science of Sociology. This conception of Pol. Econ. dealing with economic relations of men in Society has been followed by a modern economists :

Thus Gide says : “Political Economy has to do with the relations of men living in society, so far as these relations tend to satisfy the wants of life and concerns the efforts made to provide for all that is generally understood by material welfare.”

Prof. Marshall says :—“Political Economy or Economics is a study of mankind in the ordinary business of life ; it examines that part of the individual and social action which is most closely connected with the attainment and with the use of the material requisites of well-being.”

Prof. Ely defines Political Economy as the “science which treats of those social phenomena that are due to the wealth getting and the wealth-using activity of man.”

The above definitions are only new forms of putting the old definition, viz. Economics is a science of wealth, but also add that as the ordinary business of life cannot but mould the characters of men who pursue it, Economics is an ordinary daily agent in the shaping of human character. It is a study of man and not simply a study of the phenomena of wealth. The earlier economists who overlooked this point looked upon man simply as a *producer* of wealth, as one by whom necessities and comforts of life were created. But the infinitely greater truth is that man is also a *con-*

number of wealth for whom the necessities and luxuries of life are all produced. They also made the second mistake in overlooking the part played by labourers as such and in laying an undue stress on the economic activity of the one particular class, viz the employing class or the "Entrepreneurs."

Thus contradicting the old mode of studying Political Economy, a wider scope has been given to Economics by including it in the wider science of sociology which investigates the actions of all agents, including wealth, which shape human character and develop the human race in body and in mind individually and collectively as members of Society.

This idea has been very nicely put by Mr. Sargent thus:

"Economics is the social science which treats of men's wants and of the goods upon which the satisfaction of his wants depends." Briefly, Economics is the 'social science of business.'

S. MAJUMDAR

SHYLOCK, THE JEW

The picture of Shylock has been painted in different colours, some are black and some white. The consensus of modern opinions lean rather on the latter than on the former side. Now Shylock is more a man than a villain.

The first thing, which appears to a superficial observer, when he analyses the character of Shylock, is his *avarice*. Shylock had an insatiable thirst for money. He would not shrink from doing anything, which added to his coffers. This is the opinion which is formed at the first sight of the indomitable money lender, and this impression colours all others. Now what are the proofs adduced in favour of the assertion of Shylock's villainy? Shylock's treatment of his daughter, after the latter's elopement with Lorenzo and his treatment of the Christians, in general, also, the memorable trial scene, where the Jew is insisting on his due pound of Antonio's flesh, who has proved defaulter.

To examine by the item. It is true, that Shylock treated his daughter with harshness. But what made him harsh towards his "own flesh and blood?" It was certainly not a direct outcome of his avaricious nature. So long as Jessica kept to her father's faith, and did not think of any clandestine traffic with a "Christian," Shylock was, to his daughter, no less than what a father should be. At any rate, he did not evince any unusual behaviour. If, after what Tubal had told him, Shylock cried, 'I would my daughter were dead at my foot and the jewels in her ear! would she were hearsed at my foot, and the ducats in her coffin! it was not only for his 'jewels' and 'ducats', that he went to this speech, but there was something more. The thought, that his daughter—*his* daughter had eloped with a Christian, had much to do in the make-up of this exclamation. That a Jew's daughter, and that Jew Shylock himself should elope with and marry a Christian was a severe blow to the dignity of his nation. And this detestation of the Christians, was thoroughly justified by *their* treatment of the Jews. The Christians' persecutors did not think any insult, however great, too great for the usurious Jews. Did they call themselves good Christians, when they acted in the manner, that Antonio delighted to treat Shylock with, towards the Israelites. What business had Salanio and Salanio, both very good men in their own fold, to play with the feelings of the old and depressed Jew, when he was really bruised at heart, not so much, I think, for his money, as for the insult and mortification brought first upon himself and then upon his nation by the undutiful conduct of his only daughter. Surely they had no justification to add insult to the injury, that they themselves had inflicted upon the poor Jew Shylock was avaricious, no doubt, and hence to blame, but to deny that Antonio and his compatriots, also acted grievously, when they behaved rudely towards Shylock, is to ignore facts in the face of circumstances, nay I am disposed almost to believe that the Christians were partly, if not wholly, responsible for the conduct of Jews.

Shylock insisted on a pound of flesh from Antonio's body, according to the stipulation signed for in the bond. He would not stray an inch from the term of the bond. He had Antonio "on the hip", and he would "feed fat the ancient grudge" he bore him. The good Prince of merchants had found himself in a fix and saw that there was no one else but Shylock, his inveterate enemy, to get him out of it. To get money for his friend's amorous voyage to Belmont, Antonio resorted to Shylock and borrowed "three thousand ducats, for three months, having "Antonio" bound". He did not hesitate to sign the fatal bond, as he was quite sure that his ships would reach harbour two months before the day, when the money would fall due. But, by some inscrutable irony of fate, his ships were wrecked,—or rather miscarried—and he could not pay his creditor. The natural consequence was that he must pay the forfeiture. The stipulated time passed away, and Shylock refused to accept three times the sum and even more. He insisted on his pound of flesh. The plea, he put forward for this obstinacy, is clearly expressed in the original conversation between Salanio and Shylock—"Salanio. Why, I am sure, if he forfeit, thou wilt not take his flesh : what's that good for ?

Shylock. To bait fish withal : if it will feed nothing else, *it will feed my revenge*. He hath disgraced me, and hindered me half a million ; laughed at my losses, mocked at my gains, *scorned my nation*, thwarted my bargains, cooled my friends, heated mine enemies ; *what's his reason ? I am a Jew*. Hath not a Jew eyes ? hath not a Jew hands, organs, dimensions, senses, affections, passions ? fed with the same food, hurt with the same weapons, subject to the same diseases ; healed by the same means, warmed and cooled by the same winter and summer, as a Christian is ? If you prick us, do we not bleed ? if you tickle us, do we not laugh ? if you poison us, do we not die ? and if you wrong us, shall we not revenge ? if we are like you in the rest, we will resemble you in that. If a Jew wrong a Christian, what is his humility ? revenge : if a Christian wrong a Jew,

what should his sufferance be by Christian example ? why, revenge. The villany you teach me, I will execute, and it shall go hard but I will better the instruction.

(The Italics are mine.)

That was Shylock's plea. His object was revenge. He stood upon it, and everyone thought that Shylock would win the case, when came in incarnation of Mercy, in the person of Portia, disguised as the Doctor of Law and turned the table upon Shylock. The trial was conducted with perfect justice, and Shylock, I am bound to say, was rightly served in having the punishment, which he deserved. He chose to turn Law into his minion, which it can never be, and grim Justice only recoiled on himself. If he had acted with more straightforwardness, he would have earned our admiration. One cannot help admiring his spirit of revenge, as having emanated from a sense of patriotism, but one cannot also help condemning the way in which he sought to compass his end. He beat about the bush and would not come out to meet his foe face to face ; and what was worse, he held out "Law" and "Justice" as his plea. It may be said here, in his favour, that by constant persecution, Shylock grew desperate, so much so, that he caught the first available opportunity to fulfil his purpose. But he should have taken hold of something less exalted than "Law" and "Justice". If "Law" and "Justice" be made the agent of malice and retribution, their value is gone, they are no longer respected, and a social discord and revolution follows as consequence. So, no secondary purpose, however grand and admirable, in the main, should be sought to be accomplished by these two sacred things. They should be kept only for what they are meant. A villain should not be allowed to play his tricks within the bounds of law ; he shouldn't be surprised, if, in that case, law apply too literally to himself. Law is below no one ; on the other hand, everyone is below law.

One thing, by the bye, Shylock was bent upon taking Antonio's life,—for so his determination

amounted to. He hired an officer with a retaining fee, and led on the gaoler to arrest Antonio. He would not hear a syllable of mercy, and says,

"Gaoler, look to him : tell not me of mercy ;

This is the fool that lent out money gratis ;

Gaoler look to him."

"Hear me yet, good Shylock", says Antonio—
(Act III, Scene 3) [Shylock, then, is 'good' for sometime, at any rate.]

Put this expostulation of Antonio's, side by side with what the same gentleman had said sometime ago, when he had come to borrow money of the Jew.

"Antonio. I am as like to call thee so again,

To spit on thee again, to spurn thee too.

If thou wilt lend this money, lend it not

As to thy friends —* * * *

But lend it rather to thine enemy ;

Who, if he break, thou mayst with

better face

Exact the penalty."

To continue Act III, Scene 3., [my bond ;

"Shylock. I will have my bond, speak not against

I have sworn an oath that I will have

my bond.

Thou call'dst me dog, before thou

hadst cause

But since I am a dog, beware my

fangs :"

And so on, in the same strain.

"Antonio. I pray thee, hear me speak."

It is interesting to note difference in mood, on the part of Antonio. Antonio, who condescended to show no more curtesy to Shylock, than spitting on his "Jewish gaberdine" and calling him "cut-throat dog," now comes down to beg, almost on his knees, of the self-same Shylock, saying, "I pray thee, hear me speak." Comparisons are odious, I am afraid. Then look at the attitude of another Christian, who burst out, Shylock having persistently refused to yield to the "Christian intercessors," "It is the most impenetrable cur that ever kept with men."

Most diplomatically and discreetly Salarino kept silent, while Antonio was labouring to mollify his

implacable foe, only hoping that Shylock would calm down. But when he finds that the Jew is determined, he makes the best of the situation by abusing the enemy, who refuses to be quiet by any manner or means,—even by entreaty. It may be said by way of Antonio's defence, that allowance should be made for a man, when his life is in question, and that no one can help betraying weakness at such a critical moment,—not even Antonio. I say, we could excuse such weakness in Launcelot, in Gratiano, why even in Bassanio, and what more, in Shylock too, but not in Antonio. The way in which he conducted himself before and after this momentous scene with the gaoler, earn, for Antonio, the qualifying appellations of 'straightforward' and 'noble'. He is a Prince of merchants and of men, and one would like to find in him, more of the philosophic spirit of calm and dignified resignation and fortitude, as

"Antonio. I am armed and well prepared.—

Give me your hand, Bassanio : fare

you well !

Grieve not that I am fallen to this

for you :

For herein Fortune shows herself

more kind

Than in her custom. * * *

* * * * *

Repent not that he pays your debt ;

For, if the Jew do cut but deep

enough,

I'll pay it instantly with all my

heart."

than that cringing mood. There * we find Shylock and Antonio—the two adversaries, face to face, and surely Shylock has the upper hand. My idea is that Shakespeare's intention of introducing the scene with the gaoler is to put Antonio on the discount, thereby betraying the Dramatist's own sentiment about the two lifelong rivals.

Would that Antonio were as much a Christian to his enemy as to his friend.

AJAX.

UNIVERSITY QUESTIONS

UNIVERSITY OF BOMBAY.

INTERMEDIATE ARTS EXAMINATION 1911.

Wednesday, 8th November. [10-30 a.m. to 1-30 p.m.]

LOGIC.

SECTION I.

1. Give with reasons, the quantity and quality of the following propositions and determine the natural of the terms involved in each :—(1) Few and short were the prayers we said. (2) It is not every population that constitutes a nationality. (3) Primitive migrations have often been of this nature kind. (4) There are some deeds which cannot be undone. (5) A few words comprehend the summary of all the moral duties of ordinary life.

10

2. (a) Interpret the following proposition according to the various theories of predication and explain each of the above theories :—"England is a maritime colonising and industrial country."

(b) Find out the relation between the predicate and the subject in the following :—(1) Who walks through fire will hardly heed the smoke. (2) All labour is noble and holy. (3) A young man will be wiser by and by.

10

3. (a) Distinguish clearly between a definition and description of a common term and explain the different kinds of definition.

(b) Examine the following definitions :—(1) Colonies are like fruit which cling to the tree only till they ripen. (2) A tangent is a straight line which touches a curve. (3) The new world is that part of the surface of the earth which was discovered by Columbus.

10

4. (a) Give and explain the rules of definition and classification by examples of your own.

(b) Give the genus, specific property and generic difference of the term coronation.

10

5. (a) What is meant by opposition as an immediate form of inference? What inferences by *opposition* do you get from the falsity of I proposition?

(b) Find out the logical connection between the following pairs of proposition :—(1) None but the rich must marry and some who must not marry are not rich. (2) Wherever there is stagnant water there is malaria and wherever there is malaria there is stagnant water. (3) A false balance is an abomination to the Lord and a just weight is His delight.

10

SECTION II.

6. Prove by the application of syllogistic rules that the Major Premiss in Fig. I must be universal. Explain by taking concrete examples the rules you apply.

10

7. What is Reduction? Draw correct conclusions from the following premisses and prove their validity by reducing the arguments to Fig. I :—

(a) No stars are planets. All planets move round the sun.

(b) All saints have implicit trust in God, All saints render valuable service to mankind.

10

8. (a) Define Sorites and give the conditions of its validity and prove them by syllogistic rules.

(b) Express the following arguments in logical form and test their correctness :—(1) It is necessary to study Logic; for to train the intellect is necessary, and abstract sciences train the intellect, and Logic is an abstract science. (2) Monthly examinations are good for students; for they make them regular in their studies, which enables them to follow the lectures; this avoids the need of cramming and this prevents a great waste of their energy; and whatever prevents a waste of their energy is good for the students.

10

9. (a) Draw conclusions from the following premisses and invent concrete instances to illustrate the reasoning :—(1) If *A* is *B*, either *C* is *D* or *F* is *G*, *C* is not *D*. (2) If *A* is *B*, *C* is *D*; and if *E* is *F*, *G* is *H*. But either *C* is not *D* or *G* is not *H*.

(b) Rebut the following dilemma :—If people are good, preaching is not needed; and if they are bad it does them no good.

10

10. Examine the following arguments, pointing out the nature of fallacies if they contain any :—(1) It is criminal to give poison to others; therefore doctors should be punished. (2) If the charge is false, the author of it is either ignorant or malicious. But the charge is true. Therefore he is neither. (3) A sewing-machine saves half the

labour of a tailor; therefore two sewing-machines will save the whole labour. (4) Wherever there is *A*, there is *B*; and wherever there is *B*, there is *C*. Therefore wherever there is *A* there is *C*. (5) Rose is different from daisy, but daisy is a flower. Therefore rose is different from flower. 10

EXAMINATION FOR THE DEGREE OF B.Sc. 1911.

Monday, 20th November.

CHEMISTRY—PAPER

(Equations and diagrams should be given whenever possible.)

1. Given a piece of pure phosphorus, describe fully the methods you would adopt in order to determine its chemical equivalent and atomic weight. What is known about the molecular weight of phosphorus? 12

2. Write a short account of the theory of indicators. Quote examples to illustrate your answer. 12

3. What reactions take place when a current of electricity is passed through a solution of sodium chloride (*a*) with (*b*) without a porous partition in the cell? In the latter case what happens when (1) the solution is cold, (2) the solution is hot? 12

4. Describe how you would set to work in order to determine the composition of ammonia (*a*) by weight, (*b*) by volume. 12

5. Give an account of the phase rule and of the help it affords in understanding equilibria. Illustrate your answer in particular by applying the rule to the case of water. 12

6. How are the metals calcium, magnesium, aluminium, manganese obtained? 13

7. From what sources are chromium and its compounds obtained? How is the metal manufactured and what are its properties and uses? What are the most important compounds of chromium? Indicate the uses of any which are commonly employed in the industries or in the laboratory. With what other elements is chromium most nearly related, and why? 12

8. 25 c. c. of hard water when titrated with

standard soap solution required 27.9 c. c. of it to give a permanent lather. When 25 c. c. of the same water had been boiled for some time 16.8 c. c. of the soap solution were required. The soap solution being 0.00885 *N*, find the temporary and permanent hardness. Give equations representing the reactions involved and show how the water might be softened on the large scale (Soap solution may be regarded as sodium oleate *NaOl*). [Atomic weights: —*Ca* 40; *H* 1; *C* 12; *S* 32; *O* 16.] 15

CHEMISTRY—PAPER II.

1. The percentage composition of a liquid containing carbon, hydrogen and oxygen was deduced from the following numbers:—0.300 gram when submitted to combustion with copper oxide gave 0.574 gram of carbon dioxide and 0.351 gram of water. The vapour density was 23 compared with hydrogen as unity. What is the formula of the liquid? 13

2. Suggest a method for the synthesis of glycerine. How has the constitution of glycerine been determined? How is glycerine manufactured technically and what are its properties and uses? 12

3. Write a short account of the general properties and constitution of the aliphatic amines. How are they classified and how may the different classes be distinguished from each other? Describe the method of preparation of the methyl amines. 13

4. How are fumaric and maleic acids prepared? How do they differ in their properties and how may they be converted one into the other? How is the isomerism of these acids accounted for? 13

5. Give a description of the syntheses, properties and reactions of urea which show its chemical relation to carbonic acid. 13

6. Give an account of the methods of synthesizing the dihydric phenols and of the proofs of their constitution. Indicate any uses of these substances of which you may be aware.

7. Write an account of the preparation and properties of the phthalic acids and show how they are distinguished from one another. How may their relationship to benzoic acid and to benzene be shown? 13

8. Write the structural formula and give proofs of the constitution of one of the following :—indigo, uric acid. 12

B. A. EXAMINATION 1911.
POLITICAL ECONOMY.

[SECTION I. Only six questions.] 1. Define value. Distinguish between *form*, *time* and *place* value, giving examples. 12

2. Enumerate the chief factors that promote the efficiency of labour, and discuss the causes that differentiate the efficiencies of a Lancashire and a Bombay Cotton Mill-hand. 12

3. Explain the main principles of Co-operative Banking as enunciated by Raiffeisen. How far has this movement been developed in India? Discuss the moral and educational value of these institutions and the possibility of their proving the economic salvation of the Indian cultivator. 15

4. Explain how it comes about that foreign bills of exchange can be sold for more or less than their par value. 12

5. Describe the various economies in the use of metallic money which are effected in a modern industrial country. 12

6. Define "unearned increment". Does it arise in connection with the value of land only? How would you measure it? 12

7. Distinguish between *real wages*, *nominal wages*, *task wages* and *time wages*. Enumerate some of the causes of difference between real and nominal wages. 12

8. Discuss the whole question of the "Right to relief" for the poor and needy, with special reference to the Old Age Pensions and the proposed National Insurance scheme in England. 12

[SECTION II.] 9. What were the merits and demerits of the Mercantilist theory. Show how they were connected with the military and political ends of the governments of those days. 12

10. Review the history of Economic thought in England from the publication of the "Wealth of Nations" to the death of Jevons. 13

SCIENCE NOTES

AND

OTHER INTERESTING MATTERS

WEIGHING THE MIND.

Remarkable experiments are being conducted at the Carnegie Nutrition Laboratory in an effort to learn more about the interdependence of the brain and consciousness.

Dr. F. G. Benedict, the director of the laboratory, is directing the experiments, which are attracting world-wide interest. Scientists from the Universities of Vienna, Berlin, and Copenhagen have sent representatives to Boston to examine Dr. Benedict's results.

The instrument being used are so sensitive as to record the change in a person's interest from one subject to another. A number of young men and women have volunteered for the experiments, which are being conducted as secretly as possible, until the whole result can be published simultaneously.

Special attention is being directed to discover the energy formulæ for mental healing, for which purpose the hospitals are supplying patients for experimental purposes. One experiment, just concluded with Mrs. Florence Goodwin, a legal shorthand writer, shows that in using a typewriter for two hours every day, Mrs. Goodwin consumed sufficient energy to boil twenty gallons of iced water.

Mrs. Goodwin, after fasting for twenty hours, entered an airtight, box-like calorimeter which was of sufficient size to permit the use of a typewriter. Air was pumped into the calorimeter through pipes, and was carefully weighed so that the exact quantity supplied was known.

FLYING ROUND THE WORLD.

The sensational announcement was made recently that two Frenchmen were going to try to fly round the world in an aeroplane. Two Frenchmen have been found, M. Mamet, the former pilot of Bleriot aeroplanes, and M. Rene Milon. They are thinking of going, not flying round the world. They will fly only when they can. As M. Mamet explains they will fly through France, thence along the coast of Spain, cross the Straits, and follow the coast-line of Algeria, Tunis, and Tripoli, and get, if possible, by easy stages to Egypt. Thence, if flying is too dangerous, they will take a steamer to India. They will fly across India, if possible, and will take the steamer

afterwards to Australia. After this they will visit New Zealand and South America, fly over the Pampas, and take the steamer back to Europe. They will, in a word, cover as much of the tour round the world as is practicable by flying. The rest they will, cover by the ordinary means of locomotion. The voyage is estimated to occupy about 8 or 10 months.

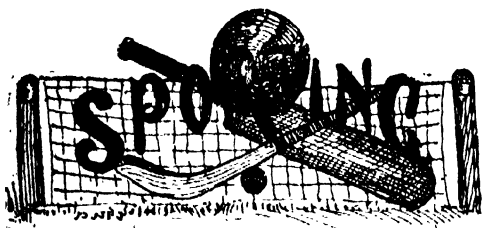
MOTOR THAT NEVER STOPS.—A young electrical inventor aged 22 has just patented a motor which he claims will run as long as its iron and steel last.

The motor is the invention of Mr. Stanley J. Hitchcock of Upper Norwood, England a former pupil of Sir Hira E. Maxim.

The Patent Office would not accept the title "Perpetual Motion," for perpetual motion in its ordinary sense is impossible. The machine is therefore called a "self-acting motor." There is no limit to its power and it will continue to run until it falls to pieces.

Its principle is magnetism, and the secret of the discovery lies in the shape of the magnets, which makes them grow stronger the more they are used. The motor revolves in response to the same forces that make the world go round.

The machine can be fitted up in private houses and used to work a dynamo, and so supply electric light, work the lift or sewing machine, do the cooking or pumping, or anything required of it, at no cost at all, except that, for lubrication.



CRICKET.

CALCUTTA C. C. vs. NATTORE.—The two days' fixture between the two premier teams of the season ended on 17th instant and resulted in a victory for the Nattore team by 10 wickets and 4 runs. The game roused a good deal of interest among the sporting

public of Calcutta. Both the teams included their best batting and bowling talents. Scores:—

Nattore—1st. Innings.

1. Devekar, b Chisholm	...	53
2. Purshottam, b Muir	...	16
3. Warden, b Muir	...	52
4. Telang, l-b-w, b Chisholm	...	14
5. Oghad Sankar, b Chisholm	...	1
6. Seshachari b Muir	...	2
7. Salamuddin, b Chisholm	...	5
8. Vithal, l-b-w, b Chisholm	...	0
9. Mehta, b Chisholm	...	11
10. Aziz, b Muir	...	13
11. M. Das not out	...	0
Extras	...	12

179

2nd Innings.

4. Not out	...	15
8. Not out	...	5
		20

C. C. C.—1st Innings.

1. White b Salamuddin	...	14
2. Shallow, c Salamuddin, b Warden	...	19
3. Bocquet, b Warden	...	1
4. Carter, b Salamuddin	...	0
5. Given-Wilson c Salamuddin b Warden	...	11
6. Turnbull, b Warden	...	6
7. Bisseker, b Warden	...	15
8. Guise, b Salamuddin	...	0
9. Chisholm, b Salamuddin	...	8
10. Lee, b Salamuddin	...	1
11. Muir, not out	...	0
Extras	...	14

Total ... 89

2nd Innings.

1. c. Warden b Salamuddin	...	19
2. b. Salamuddin	...	8
3. c. Warden b Salamuddin	...	0
4. b. Warden	...	24
5. b. Salamuddin	...	3
6. b. Warden	...	1
7. not out	...	28
8. c. Telang b Warden	...	11
9. e. Mehta b Salamuddin	...	5
10. b. Aziz	...	0
11. c. Seshachari b Salamuddin	...	5
Extra	...	1

Total ... 105

DURBAR HOCKEY FINAL.

The final of the Delhi Durbar Hockey Tournament was played on Thursday afternoon 14th instant in splendid weather, a representative gathering assembling to see it. His Imperial Majesty, attended by the Governor-General and staff, arrived when the first portion of the game was half way through and remained until the play was practically over. The competing teams were the 30th and the 33rd Punjabis. The 30th had the larger proportion of European officers and started slightly favourites. They went off with a rush and put their opponents on the defensive for several minutes and it was due to the hard work of Chamier, the centre half-back of the 33rd, that they were kept at bay. They continued to press and at last Moss of the 30th drew blood amidst great cheering and scored. This put the 33rd on their mettle and the forwards, playing with very pretty combination enabled Harrison to score with a hard low shot in the second half. The 33rd for a time had it their own way. About ten minutes after the re-start, Harrison centred from the left and the centre forward sent in a smashing shot which completely beat goalkeeper. The 30th woke up after this and made several fine attempts to equalise but without success, and a fast and even game resulted in the victory of the 33rd Punjabis by two goals to one. Captain Chamier, the captain of the winning side, who is also the Honorary Secretary of the tournament was warmly cheered.

GOLF. --The Amateur Golf Championship of India will as in previous years take place over the Tollygunge Club links between the 24th and 27th December. Altogether 50 entries have been received most of whom are Calcutta Golfers. The qualifying round will take place on Sunday.

ARRIVAL OF A FAMOUS JOCKEY. --Frank Wootton, one of England's premier jockeys, landed on 19th instant in Bombay by the P. and O. Company's steamer "Persia" together with Saxby and Bowley two other well known jockeys. They are to proceed to Calcutta, where they will take part in all the big racing fixtures. They will also ride in the big meeting in Bombay. Wootton is remaining in India till February 24th.

CUTTINGS

ANDREW CARNEGIE, LL.D.,

LORD RECTOR OF ST. ANDREWS UNIVERSITY

1901-04, 04-07.

The Lord Rectorship of our sister University of the North is not the only academic distinction which has rewarded the countless activities in many fields of him whose honourable connection with St Andrews we would pray you to pause awhile to consider. In other words, although Dr. Carnegie's official connection with the University has terminated, meanwhile we take the opportunity of reflecting on the meteoric career of one whose crowded life of devoted service to his fellow-men has been so merged in the activities of Scottish educational life, and St Andrews life in particular. We have mentioned his official separation from the University, but a Scotsman and a son of the Kingdom to boot, his interest in St Andrews and all that pertains to the welfare of her students is not the thing of a day. That indeed cannot be said to have terminated, for all around us we have permanent memorials of his perennial desire to do everything that lies in his power to make pleasant the path of professor and undergraduate alike. Truly indeed we can say of him that he has caused our lines to fall in very pleasant places.

How his splendid business ability and comprehensive knowledge of the world and men brought him to the front rank of the world's business men is a story that all the world knows. And it is noteworthy that amidst all the distractions of a strenuous life he yet was able to acquire by careful study the culture that his youth's stunted education had denied him. All honour, then, to him whose ardent desire now is to place within the reach of every Scottish student that larger culture which was denied him, and the stamp of which, by his generous benefactions, our Alma Mater can now, more easily than before, so freely bestow on

every one of her sons who crave it in the spirit of true scholarship !

But before this Dr Carnegie's name had become associated with philanthropy, and every generous scheme whereby good men thought to bring a little nearer that age of the great universal brotherhood which was the dream of his nation's poet. He was among the first—if not the very first—to institute the system of profit-sharing with his workmen.

But long before Fortune had smiled on him as kindly as She did later the patriot's thoughts were turned lovingly to his native town, and to what he could do for the land that gave him birth. Of his generous services to education alone it will suffice to speak here. Education in Scotland at that time was engaged in a grim struggle with many difficulties ; and the end of last century saw the canker-worm of poverty slowly eating its way to the vitals of our own University, when a princely gift of two million dollars of steel bonds placed Scottish education in a position of absolute independence, and auspiciously marked the dawn of a new era of better and brighter things for Scotland and her people. Of course the voice of the eternal carping critic (unfortunately we have him yet) was raised in protest, but the unqualified success of the scheme has triumphantly justified itself, and despite the critics' prophecies the independence of our national character is to-day no whit impaired. Dr Carnegie's munificent gift only affords a parallel to the State schemes of which the undoubtedly independent Scottish scholar of Reformation times, students and lecturers too, did not think beneath their dignity to take advantage. It is the dearest wish of Dr. Carnegie that the present civis should maintain the parallel, and freely give as he has been given. Time will show, as it is already doing, that his confidence in Scottish independence shall remain unshaken.

Time passed, and his literary and philanthropic work was rewarded by the degree of LL.D., which worthily marked learning's appreciation of all his labours, and it was but fitting that the happy relation which had existed between University and

Rector should be consummated by his re-election to that office for another three years. But a few weeks and we had him with us once again, and it is the fervent hope of all that before him there may be many years in which he and his charming lady may increasingly enjoy the rich reward "of a work well done : a rest well won." With his kindly words of exhortation still in our ears we would leave him thus.

—*College Echoes.*

(*St. Andrews University Magazine*).

MR. BERNARD SHAW has done good service by his wholesale condemnation of education. • He is convinced that nothing short of the most violent attack on accepted conventions will make the average man stop to think out his position and justify his attitude. If we have no right to tie a child's toes to his head and wrap his body for life, we have, equally, no right to distort his mind or his soul. Mr. G. K. Chesterton has a valuable article in a recent number of the *Eye-Witness*, in which he argues, in opposition to Mr. Shaw, that the only alternative to education is infanticide. The parent who sits by and allows his child's nails to grow as long as the claws of an eagle is presumably acting upon the theory that nail-scissors are warping. Things of the soul are less tangible ; but the parent is bound to act upon some theory. If the nail-scissors of the soul are banned, there may be distorted spiritual growth. We want the child to be able to develop freely his noblest parts ; we hesitate to put him too closely into swaddling bands. Our object is to provide a suitable *milieu* in which development may take place. But, although much of our education is undoubtedly misdirected, we cannot do without it. A gardener could not hope to be successful with his plants if he never dug or manured the soil ; if he used no sticks or bast ; if he did not water or drain ; if he failed to protect from frost or sun or wind.

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Vol. 1 THE COLLEGIAN No. 71

An All-India Journal of Education.

CALCUTTA, MONDAY 15TH JANUARY, 1912.

His Majesty the King received a deputation and address from the Calcutta University at Government House on the 6th January 1912. The deputation was headed by the Vice-Chancellor, Sir Ashutosh Mukerjee and almost all the Fellows of the University were present, in addition to representatives of every educational institution in Calcutta, and several hundred graduates, past and present, including three lady graduates. The Fellows of the University occupied seats in the Throne Room, and the graduates were accommodated in the hall-room.

His Excellency Lord Hardinge wearing the robe of Chancellor of the University introduced Sir Ashutosh Mukerjee who read the address as follows :

"May it please Your Majesties :—

"It is with feelings of the deepest devotion and loyalty that we the representatives of the University of Calcutta, avail ourselves of the high privilege of approaching your Gracious Majesties with an address. With all Indians we share the enthusiastic gratitude due to the great Sovereign and his consort who have vouchsafed to give to their affection and regard for our beloved country the most powerful and eloquent expression by coming to celebrate in India at our old Imperial city, the Coronation which took place in London last June. In addition we, the members of the Calcutta University, remember with special pride and gratitude the time, now six years ago, when Your Imperial Majesty, then Prince of Wales, graciously consented to join the ranks of our Honorary Doctors of Law. Nor do we fail to recall to mind the occasion when Your Gracious Majesty's august father, King Edward VII, of revered memory, conferred on the University a similar high honour and thereby inaugurated a connexion between the Royal House and our University which, we are proud to think, thus already possesses an hereditary character.

"We however, on the present auspicious occasion, may perhaps venture to claim that we represent not the Univer-

sity of Calcutta only, but the entire body of the Indian Universities, and taking an even wider view of the situation, that entire, ever increasing, section of the Indian people which has had a University education. In this widely representative capacity we humbly crave leave to give expression to a special feeling of gratitude. The inestimable advantages and blessings for which India is indebted to its connexion with Great Britain are of so manifold a nature that we cannot undertake even to touch on them as a whole; but there is one boon, and this surely one of the greatest, to which the representatives of the Universities feel entitled, nay bound, to refer specially—we mean the access which the union of the two countries has given us to the priceless treasures of modern western knowledge and culture, literature and science. We Indians no doubt look back with pride and reverence to what, in the days of old, our fore-fathers accomplished in the fields of thought and knowledge; but we at the same time fully realize that, in order to advance the greatness and happiness of our country and to reconquer for it an honourable place among the great progressive nations of the world, we must, in the first place, strenuously endeavour to arm ourselves with all the knowledge, all the science, all the skill of the West. When, therefore, appearing before our Gracious King-Emperor, who symbolizes to us in his own person as it were the happy union between Great Britain and India and all the blessings springing from it, we, the representatives of the Indian Universities, feel strongly urged to give expression to a feeling of deep gratitude—gratitude to Providence for the kind dispensation which has tied the fates of India to those of a western country so advanced and enlightened as Great Britain—gratitude to our Rulers who long ago initiated and ever since have adhered to a far-sighted and sympathetic policy of public instruction and education through the beneficent action of which the light of modern knowledge is gradually spreading through the whole length and breadth of the land. And with this expression of gratitude it behoves us to couple a further assurance. We humbly request permission to assure Your Gracious Majesties that the Indian Universities which are the leaders in the great intellectual movement that at present is re-shaping India are vividly conscious of the very weight responsibilities which this their place and function impose on them. They realize that it is their duty not only to promote and foster but also to guide and control the country's advance on the paths of enlightenment and knowledge and to provide safeguards as far as it is in their power, so that the enthusiasm which a sudden widening of the intellectual horizon is apt to engender in youthful minds may not tend to impair or weaken those great conservative forces without the constant silent action of which no nation can achieve true greatness and well-

being—the forces of respect for order, reverence for law and good custom, loyalty to established authority. We venture to assure Your Gracious Majesties that the Indian Universities while ambitious to be leaders in boundless intellectual advance are no less anxious to act as centres of stability—moral, social and political; that they will ever view it as a supreme duty to strengthen the bonds which connect India with Great Britain and the Royal House and that they rejoice in the thought that it may be given to them to contribute their share towards the successful accomplishment, under Providence, of that great task which the world wide British Empire has taken upon itself for the good of humanity."

The address, and a beautiful silver casket, were then presented to the King.

His Majesty the King, in reply, said:—

"I recall with pleasure the occasion on which, six years ago I received from the University of Calcutta the honorary degree of Doctor of Law, and I am glad to have this opportunity to-day of showing my deep and earnest interest in the higher education of India. It is to the Universities of India that I look to assist in that cordial union and fusion of the culture and aspirations of Europeans and Indians on which the future welfare of India so greatly depends. I have watched with keen sympathy the measures that from time to time have been taken by the Universities of India to extend the scope and raise the standards of instruction.

"Much remains to be done. No University is nowadays complete unless it is equipped with teaching faculties in all the more important branches of the sciences and the arts, and unless it provides ample opportunities for research. You have to conserve the ancient learning and simultaneously push forward western science. You have also to build up character, without which learning is of little value. You say that you recognise your great responsibilities. I bid you God-speed in the work that is before you. Let your ideas be high and your efforts to pursue them unceasing, and under Providence you will succeed.

"Six years ago I sent from England to India a message of sympathy. To-day, in India, I give to India the watchword of "Hope." On every side I trace the signs and stirrings of new life. Education has given you hope, and through better and higher education you will build up higher and better hopes.

"The announcement was made at Delhi by my command that my Governor in Council will allot large sums for the expansion and improvement of education in India. It is my wish that there shall be spread over the land a network of schools and colleges from which will go forth loyal, manly and useful citizens able to hold their own in industries and agriculture and all the vocations of life; and it is my wish, too, that the homes of my Indian sub-

jects may be brightened, their labours sweetened by the spread of knowledge with all that follows in its train—a higher level of thought, of comfort and of health. It is through education that my wish will be fulfilled, and the cause of education in India will ever be very close to my heart.

"It is gratifying to me to be assured of your devotion to myself and to my house, of your desire to strengthen the bonds of union between Great Britain and India, and of your appreciation of the advantages which you enjoy under British rule. I thank you for your loyal and dutiful address."

The members of the deputation then passed in front of His Majesty, bowed and retired.

* * *

We deeply regret to record the death on the morning of December 28th, 1911, at Madras, of the

Honourable Mr. Venkatarama Krishnaswamy Aiyar, C. S. I., B. A., Member Madras Executive Council, at the early

age of forty eight. A man of high character, genuine patriotism, remarkable energy and strong principles Mr. Aiyar was held in high esteem both by Government and his countrymen. His Excellency the Governor of Madras in an Extraordinary gazette expressed his sense of the great loss which his Government and the Presidency have suffered and placed on record high appreciation of the wide knowledge, conspicuous ability and sound judgement which the late Mr. Krishnaswami Aiyar throughout his all too short career was ever willing to place at the service of his colleagues in the loyal discharge of the duties of his high office.

Born of an orthodox Brahmin family at Tanjore, he was a notable example of a man who was the architect of his own fortune. His marked legal acumen raised him to the front rank of the legal practitioners of his day. From his crowded consulting room he was translated to the bench and before long he was called to the exalted office as a member of the Executive Council.

His death is an irreparable loss to the country. We offer our sincerest condolences to his family in their sad bereavement.

[His last vigorous public utterance was the Convocation Address delivered by him at the Madras University Senate House on the 23rd Nov. 1911]

* * *

Mr. Habibur Rahman Khan of the Indian Telegraph Department was admitted as a member of the Royal Institution in recognition of his investigations regarding the possibilities of Water Wireless Telegraphy. Mr. Rahman is also a Member of several learned Societies in England, America and Europe. The value of the discovery cannot be better described than in the words of the Prof. Baker who said that "there are very remarkable future possibilities in the system devised by Mr. Habibur Rahman and it is very notable that he has worked very long distances through river with the small power available from the primary Cardew Vibrator."

Original
Research
by an
Indian

* * *

The President moved a resolution for a better provision for education, urging (a) to assign further money to secondary and higher education (special encouragement being given necessarily to educate all backward classes); (b) to make provisions for imparting commercial and technical education in the different provinces, having regard to local requirements; and (c) to give effective voice to the leaders of the Indian public opinion in shaping the policy and system of education in this country. The resolution was put and carried.

* * *

The third educational conference in connection with the Theosophical Convention was held at Benares. Many interesting speeches were delivered. Miss Arundale spoke on the education of the depressed classes, Professor Telang on the teaching of History, Baroness Asbeck spoke on the Educational movement in France, Mrs. Besant in the course of her concluding remarks referred to denominational universities, she said that with the spread of education the gulf between the Hindus and Mahomedans would be bridged. She looked forward with the warmest hope to the future of the Hindu University. The obtaining of that boon then depended only on the collection of funds.

Ed. and
Con- ven-
Ben

* * *

The Idigagowda community (toddy dealers) have held a conference at Guntakal and decided to open a King George School at Bellary for Idiga boys in commemoration of the Royal visit to India. Rs. 12,000 has been subscribed for the purpose.

* *

Bakshi Ram Rattan, B. A. L. T., Headmaster of the Lahore D. A. V. High School, has, in a communication to the Arya Gazette, made a proposal which, if carried into practice, cannot but be of great help in the moral education of school boys. He suggests that Sunday Schools after the manner of those established by the Christian Missionaries in India be opened in every town and village for imparting religious and moral instruction to the boys.

Moral
Education of
school boys

* *

Mr. Vincent A. Smith, Deputy Reader in Indian History, has been elected to the seat on the Board of Curators of the Indian Institute at Oxford.

Mr. Vincent
Smith

* *

This year's Nobel Peace Prize has been awarded jointly to M. T. M. C. Asser, a member of the Dutch Council of State, and to the author, M. Alfred H. Fried, editor of the Vienna journal, "Friedenswarte." Each receives half the prize of about £6,000. M. Tobias Michael Carel Asser is a well-known international lawyer, at one time professor at Amsterdam, and since then "juris consult" at the Ministry for Foreign Affairs and member of the Council of the State. He represented Holland at numerous international congresses. Herr Alfred Fried is one of the most prominent figures in the peace movement on the Continent. He was born in 1867 at Vienna, and has engaged in international peace propaganda ever since 1892, when he founded the German Peace Society.

The Nobel
Peace prize



CALCUTTA UNIVERSITY

The Right Hon'ble the Secretary of the State for India paid a visit to the University on the 20th December 1911. He was received by the Vice-Chancellor and was shown over the Library, the Law College and the Darbhanga Building. The Registrar and the Principal of the University Law College were also in attendance and were introduced to His Lordship. Lord Crewe expressed himself well pleased with the progress recently made in the University.

Lord Crewe
pays a visit

A largely attended meeting of the fellows of the Calcutta University has held on the 23rd December 1911 when Sir Gooroodass Banerjee in proposing "That the Senate record their loyal expression of gratitude to His Majesty, the King-Emperor, for conferring on their Vice-Chancellor, the dignity of Knighthood and they offer their hearty congratulations to the Hon. the Vice-Chancellor on his well-earned distinction," said "the motion is of an unique description. There have been Vice-Chancellors who have received similar honours either before becoming Vice-Chancellors or after resigning that office. Moreover they received their honors more for other considerations than out of regard for their services to the University. In the present circumstance, the recipient of the honour, though his work in his judicial sphere is of a most valuable and conspicuous character, has, I believe, received this honor more out of consideration for his work in the field of education than any recognition of his judicial work."

Sir Ashutosh
Mukerji, Kt.

The Senate unanimously elected Dr. Kedār Nath Das as a member of the Member of Syndicate Syndicate for the remainder of the current year, in the place of Dr. S. Sarbadhikari, whose tenure of office expired on the 7th Dec.

— — —

Applications from five lady candidates for permission to appear as Non-collegiate Students were considered: Miss Margaret Hickey and Miss Lucy Knight for the B. A. Degree; Miss Julia Gomez, Miss Sunitibala Sen and Miss Mollie Cohen for I. A. Exam.

The Preliminary Examination in Law in June 1912 will be held on Monday, the 24th of June 1912, and the following day. The Intermediate Examination in Law in June 1912 will be held on Wednesday, the 26th of June 1912, and the following day. The Final Examination in Law in June 1912 will be held on Friday, the 28th of June 1912, and the following day. Applications and fees for admission to the Examinations should reach the office of the Registrar on or before the 26th of May 1912.

— — —

The following Scholarships and Medals are awarded in addition to those already announced:—

MATRIC:—*Behari Lal Bosu Scholarship*—Prahladchandra Daw; *Raj Krishna Kshetramani do*;—Sunitikumar Banerji and Bhabaniprosad Chakarvarti, *Kisorimohan Harakinkari Schol.*—Rabindra nath Chaudhuri and Narendra nath Ray; *Duke Memorial do.*—Rammohan Mitra; *Rajkishari Dasi & Durga Dasi do.*—Radhakanta Nandi; *Dwarkanath do.*—Jatindra nath Chakravarti; *Priyanath Dutta do.*—Jyotirmoyi Ghosh.

INT.:—*Saradaprasad Scholarship*—Kalipada Banerji; *Priya nath Dutt do.*—Kshemada Ray.

B. A. & B. Sc.:—*Woodrow Scholarship*—Trailakyanath Dutta, *Amrita Mitra Prize*—Keshodyal, *Jubilee Post graduate Schol.*—Durgaprasad Khaitan.

M. A. & M. Sc.:—*Cobden Medal*—Bhujangabhusan Mukerji; *Sonamani Prize*—Pasupati

Bhattacharji; *Matilal Mallik Medal*—Priyadarshan Ray; *Hem Gossain Medal and Prize in Sanskrit*—Pasupati Bhattacharjee, *Do. in Science*—Sarat chandra Jana; *Kshetramohan Chatterji Medal*—Kaliprosad Khaitan.

B. E.:—*Ambica Charan Chaudhuri Medal and Trevor Medal*—Surendra Mohon Chaudhuri.

MADRAS UNIVERSITY.

Applications for the scholarship, which will be placed at the disposal of this University in the year 1912, will be received by the Registrar up to 15th March 1911.

Applicants should furnish all necessary information specified in the following rules for the selection of candidates for the scholarship:—
(1) That the scholarship be open to all Bachelors and Masters of Art, Bachelors and Masters of Law, Bachelors and Doctors of Medicine and Bachelors of Engineering of the University, who are under 22 years of age on the 31st day of March in the year in which the selection is made. (See however paragraph II below.) (2) That application for scholarship must reach the Registrar not later than the 15th March. (3) That each candidate be required to furnish along with this application proofs that he satisfies all the conditions laid down by the Government of India in their Resolution No. 1/15-57, Home Department, dated 12th February 1886, as amended by a subsequent resolution recorded in Madras G. O. No. 589, Educational, dated 10th September 1886.

N. B.—The conditions are—

- (i) That the candidate is a native of India within the meaning of the statute;
- (ii) that he is under 22 years of age on the 31st day of March in the year in which the selection is made;
- (iii) that he has the consent of his family (i.e. of his father if alive, if deceased, of his guardian) to proceed to England;
- (iv) that his conduct has been good;
- (v) that he has sufficient knowledge of the English language; and
- (vi) the physical capacity to undergo the course of life and study he will have to follow in England.

(4) That the scholar shall selected by the Vice-Chancellor on the report of the Syndicate, who will, in their turn, be guided by the opinion of the professors and Examiners. The scholar selected shall be provided with a free passage to and from England,

The Government of India have raised the age-limit to 25 years in the case of Medical Graduates of the Madras University and to 23 years in the case of person holding other degrees, viz., those of M.A., B.L., and B. Sc. (See G. O. No. 146, Educational, dated 13th march 1911).

The attention of intending applicants is drawn to the revised rules framed by the Secretary of State for the guidance of Indian Government Scholars in England published in the *Fort St. George Gazette* of 4th April 1911, page 206, and which will be reprinted in Volume II of the Madras University Calendar for 1912.

ALLAHABAD UNIVERSITY. REGULATION IN MEDICINE.

At the annual meeting of the Senate Colonel Manifold moved that the following regulations be added as a new chapter of the University regulations to be included in the Calendar, together with amendments to the existing regulations :—

1. The examination for the degree of Bachelor of Medicine and Bachelor of Surgery shall consist of three parts, viz. :—

I.—The Preliminary Scientific Examination for the degree of Bachelor of Medicine and Surgery.

II.—The Second Examination for the degree of Bachelor of Medicine and Bachelor of Surgery.

III.—The Final Examination for the degree of Bachelor of medicine and Bachelor of Surgery.

2. These examinations shall be held once in every year on such date or dates as the Syndicate may determine (the examination in Group A of the Final Examination may be held twice in each year). Notwithstanding anything contained in Regulation 12, Chapter XII of the regulations of the University, the first and the final examinations for

the degree of Bachelor of Medicine and Bachelor of Surgery shall be held at Lucknow and the Preliminary Scientific examination for the degree of Bachelor of Medicine and Bachelor of Surgery shall be held at such place or places as the Syndicate may from time to time determine.

3. The Faculty of Medicine shall from time to time prescribe the course of study in the various subjects of the examination. It may prescribe or recommend text-books for study.

4. The examination shall be held in such manner and in such order as the Syndicate may in consultation with the Faculty of Medicine direct. They shall be conducted partly by means of paper and partly *visu voce*. Candidates shall also be required to undergo a practical examination.

1.—PRELIMINARY SCIENTIFIC EXAMINATION FOR THE DEGREE OF BACHELOR OF MEDICINE.

5. The Preliminary Scientific Examination for the degrees of Bachelor of Medicine and Bachelor of Surgery shall be open to all students who—

(i) have passed the Intermediate Examination of this University with Biology, Physics and Chemistry, or in Chemistry and Physics, and who have also passed in Biology in the examination for B. Sc.,

(ii) under regulation 6 of this chapter are qualified to appear at this examination ;

(iii) any persons to whom the Senate by special grace, under section 19 of the Indian Universities Act of 1904, has granted permission to appear,

5a. Up to the end of 1913, this examination shall be open to all students who have since passing the said examinations with Physics and Chemistry attended a regular course of study in Biology for not less than one academical year in—

(a) a College affiliated in Biology to the University,

(b) the Calcutta medical College.

Such candidates shall be examined in Biology. This regulation shall cease to be of force after 1st October, 1913.

6. Any student who has passed the Inter-

mediate examination of the Universities of Calcutta, Madras, Bombay of the Punjab, with Chemistry, Physics and Biology or the Preliminary Scientific Examination of the Calcutta University, and who wishes to proceed to the degree of Bachelor of Medicine and Bachelor of Surgery in this University, may be admitted to the examination, provided he satisfies the Registrar

(i) by a declaration that his parents or guardians either are residents of or have migrated or have been transferred to a station within the territorial jurisdiction of this University ;

(ii) by a certificate that the said examination, has been passed in the same year as the First Examination for the degree of Bachelor of Medicine and Bachelor of Surgery at which the candidate desires to appear.

7. Candidates, entitled to sit for the Preliminary Scientific Examination for the degree of Bachelor of Medicine and Bachelor of Surgery under regulation 5 of this chapter who have passed the examination for admission to Lucknow Medical College in 1911, shall be deemed to have passed the Preliminary Scientific Examination for the degree of Bachelor of Medicine and Bachelor of Surgery.

TO BE CONTINUED.

GOVERNMENT NOTIFICATIONS AND ORDERS.

BENGAL AND BURMA.

The budget grant for the year 1910-11 under '22—Education' was Rs. 59,17,000, and the actual expenditure reported by the Accountant-General, Bengal, amounted to Rs. 55,21,364. Out of this Rs. 5,88,810 represents Government contribution to district boards for education, and Rs. 6,84,518, fees, etc., in Government institutions. The net departmental expenditure from provincial revenues thus stands at Rs. 42,48,056, to which is to be

added Rs. 2,31,596 for the Medical College, Rs. 91,439, for the medical schools, and Rs. 4,62,620 on account of educational buildings, which was spent through the Public Works Department ; and the total works out at Rs. 50,39,711, which is Rs. 17,47,436 in excess of the grand total Rs. 50,16,275 in column 34 of General Table IV. Steps will be taken to reconcile this small difference in consultation with the Accountant-General, Bengal.

The number of superior inspecting officer for the Province, remained unaltered. The proposal about the redistribution of existing additional inspectors so as to post them to the divisions where high schools are most numerous was submitted to Government during the year and it has been sanctioned. Under the new arrangement there is no additional inspector in the Bhagalpur, Chota Nagpur, or Orissa Division.

Orders were passed during the year for the transference of all deputy (35), additional deputy (25), and sub-inspector (310) including those recently provincialized, to separate cadre. Definite proposals in this regard will shortly be submitted to Government.

In the year under review the number of girls receiving instruction rose from 167,514 to 173,204.

This increase has been shared more or less by almost all classes of institutions. The upper classes of girls, high schools are beginning to attract more pupils, and though fees have in some cases been raised, parents have shown no great opposition to the enhancement. The system of *parda* examinations has aroused an interest in learning and the girls under the care of the peripatetic teachers are reported to be growing studious in disposition.

Progress in the primary education of girls in village schools is naturally slow owing to the lack of trained teachers, the smallness of salaries, and the prejudices of conservative villagers.

(Extract from the Report of D. P. I. Bengal).

Expenses on
Education in
Bengal

Education
Agency
(Bengal)

Education
Agency
(Bengal)

MADRAS AND CEYLON.

A Government order has been issued relating to the singing of the National Anthem in schools, and fixing up in conspicuous places in schools in the Madras Presidency of short proverbs and petty sayings in vernacular.

A Government order

It notified that a Government Training school for Mistresses will be opened at Rajahmundry on 1st February 1912. The period of training will be one year in the case of students who have passed the Seventh standard Examination and two years in the case of others possessing qualifications below the above standard. Stipends will be awarded in accordance with the rules of the Madras Educational Rules. Female candidates who wish to undergo training are requested to send in their applications, for admission, in the form given in the Educational Rules, so as to reach the the Inspector of school before the 15th January 1912. Certificates of age, health and vaccination, general education and character, should accompany the applications.

Training school for Mistresses

BOMBAY AND THE NATIVE STATES

Regarding the registration of Indian libraries, the Bombay Government have issued certain instructions which state that a register of approved libraries will continue to be kept by the Director of Public Instruction who is given full discretion to grant or refuse registration. No library will be registered the management of which does not agree to conduct it in accordance with the rules promulgated in the Government resolution on registration. The Library will be accorded the following official support—free supply of departmental publications of books purchased by Government which are considered suitable for distribution in this way and of annual reports issued by Government; free supply of press notes in English and

Libraries and Government

appropriate vernacular, and free supply of Part I of the Bombay Government Gazette. No Government servant shall join or remain a member of any of the libraries which has not been registered. No grants from State funds shall be paid to libraries which have not been registered and the attention of each Municipality and Local Board concerned should be drawn to the impropriety of according any support, financial or other, to such libraries. These instructions apply only to libraries which take in vernacular newspapers and literature.

The progress in education which was noticed in the previous year has continued. Taking all institutions together the number of persons under instruction rose from 850,000 to 869,000 (figures to nearest thousand) an increase of 19,000 of which the greater part 17,000 occurred in institutions under the inspection of the Department. The total expenditure again showed a large increase of Rs. 5,22,466 of which more than one-half was devoted to primary instruction. The increase in expenditure from provincial funds alone was Rs. 2,29,889, and provincial funds now bear 45 per cent, of the total cost of education in the Presidency including the cost of aided institutions.

Education Figures

(From D. P. I's Report.)

PUNJAB AND ITS DEPENDENCES.

Dr. M. A. Stein has returned to Peshawar to take over charge of his new post as Superintendent of Archaeological Survey, Frontier Circle. His deputation on special duty to England has enabled him to complete at the British Museum the arrangement and cataloguing of a great collection of antiquities which rewarded his explorations in Central Asia and westernmost China during 1906-08 and which at present forms the joint property of the Indian Government and the Trustees of the British Museum.

Frontier Archaeologist



AND SCHOOLS

Applications for admission as regular students to the Engineer Department of the Civil Engineering College, Sibpur, will be received by the Principal up to 1st February 1912 in accordance with rule 9 of the Engineer Department Rules. Every such application should be accompanied by a registration and Examination fee of Rs. 4, which shall in no case be refunded. Candidates must appear at a special Drawing test as laid down in rules 10(b) and 13 which will be held in connection with the University examinations. The exact date and centres will be announced when fixed. The applicant for admission must produce with his application a medical certificate in the prescribed form signed within one month of its submission by a Civil Surgeon. No other from will be accepted. Candidates, if they so desire, may present themselves for medical examination before the Medical Officer resident at the Civil Engineering College Sibpur, on Mondays and Thursdays from 7 to 10 A. M. Special students are also admitted; they must apply before 1st July.

The Senate of the Calcutta University at its meeting of 23rd December 1911, granted further affiliation to the Jagannath College, Dacca, in History and Political Economy and Political Philosophy to the B. A. Pass standard with effect from the commencement of the next session.

Affiliation has also been granted to the Chittagong College in Mathematics up to the B. A. and B. Sc. Honours standard with effect from the next session.

The celebration of the Anniversary of the Debating Society attached to the Zamorin's College come off on Saturday the 23rd December 1911. Mr. Rangachari, M. A., L. T. Botany Professor of the Agricultural College, Coimbatore, presided, when Revd. W. Jones of the St Mary's

Church Calicut delivered an address on "Ideal State." Trial scene from the "Merchant of Venice" was staged by some of the students of the higher classes.

The scheme for handing over to Government the control of the Gujrat College for which Sir Chinubhai Madhavlal has generously given an endowment fund of two lakhs of rupees and Mr. Ambalal Sarabhai has given a donation of Rs. 31,000 for a hostel, was taken in hand and is under consideration.

(From D. P. P's report.)

The prize distribution ceremony of the Anglo Vernacular school was held on the 20th December 1911 at 5 P. M. in the local vernacular school. The Assistant Resident Mr. Tate was duly elected to the chair. The Headmaster read the report giving an account of working of the school. After the report was over the recitations and dialogues prepared for the occasion were gone through. Mrs. Tate then distributed the prizes to the successful students. The distribution ending the President addressed the meeting. He insisted upon the public to support the cause of education through which alone he assured them they can hope to rise. He congratulated the whole school staff for the complete success and concluded his speech by a most instructive piece of advice to the students and directed them to pay respect and obedience to their elders, and resumed his seat by saying "Manner maketh Man". A vote of thanks was then proposed to the chairman of the day and the gathering dispersed amidst loud cheers.

The site of the new Engineering College has been fixed at Rasul where the headquarters of the Jhelum canal are located. The College is intended eventually to accommodate the hundred students. At present portions of the boarding house and workshops are being fitted up to serve as class rooms for forty students.

Lala Hansraj Honorary Principal of the Dayanand Anglo-Vedic College, has tendered the resignation of his office of Principal of the College from 31st

January 1912 and will take up the Presidentship of the Managing Committee of the College, after serving the college for twenty five years. "In obedience to his vow which he took in 1885 he has served with his whole heart and might the Great Master (Shri Swami Dyanand Saraswati) through whom he received the light of vedic truth."

During Her Imperial Majesty's stay at Ajmer

Her Majesty
the Empress-
Queen at the
Mayo College,
Ajmer

Her Majesty visited the Mayo College,
on the 20th December 1911.

Her Majesty on arrival at the College was received at the main entrance by the Principal, Mr. Waddington, C. I. E., M. V. O. the boys being grouped on either side of the steps. The latter, all in Durbar dress, made a wonderful picture of colour against the snow-white back ground of the College building. Her Majesty then entered the College Hall, and after the staff and the monitors had been presented, signed her name in the visitors book and accepted a photograph album and a volume of the College magazine from the hands of the head monitor. On reaching the cricket ground the Queen-Empress was received on the steps of the pavilion by Mrs. Waddington and the ladies of the College Staff, and was presented with a bouquet of red roses by the little Maharaja of Bhurtpur, who was one of the Emperor's pages at the Delhi Durbar. Among the boys presented were Rajkumar Hari Singh of Kashmir, Maharaja Kumar Himmat Singh of Idar, Raj Kumar Alakh Narain of Vizianagram, Maharaj Kumar Purna Chandra of Mourbhhanj, Nawab Ikbal Ali Beg of Hyderabad, Kanwar Bahadur Shamsheer Jung of Nepal, these names in themselves affording a significant testimony to the fame of the College throughout the length and breadth of the Indian Empire.

The thirteenth anniversary of the Central Hindu College was celebrated at Benares on the 26th Dec. 1911, Raja Madholal was in the chair. Distinguished people from many parts of the country were present, also a large number of delegates to the Theosophical Convention. The Raja made a short speech eulogising Mrs. Besant for her untiring work in building up the college. The Secretary's report showed all round progress of the college which was affiliated to the M.A. standard in English, Sanskrit, History with Political Economy and Mathematics. Professor Sorabji was given the Government of India scholarship for the study of Sanskrit and had gone to England. Two graduates of Hindu College have also gone to compete for the Indian Civil Service. The chief gifts in the year were the Maharaja of Benares' gift of Khurdmahal valued at Rs. 50,000 and Seth Dharamsey's gift of Rs. 5,000 for a gymnasium. The report of the Inspector of Schools was very appreciative. The chief visitors during the year were Lord and Lady Minto.

Owing to lack of support from the Hindu public, the report mentioned, the Committee were compelled to raise the scale of fees to half that charged in Government schools and colleges.

Mr. G. S. Arundale, Honorary Principal of the College, delivered an address in the course of which he said that the growth of the college could not be measured only by physical and intellectual progress but by the number of selfless patriotic citizens of the country.

Mrs. Besant, who spoke last, in the course of her speech showed how the college had made its way through the period of unrest, keeping its pupils aloof from party politics and taking within its fold and sending out into the world as loyal subjects of the Emperor and self-respecting citizens of India, youths who were expelled from other colleges and schools for being instruments of irresponsible men, and how it had made religious education possible among Hindus with their warring sects and creeds.

After refreshments the audience moved to the playground where a splendid display of magic lantern and drill brought the proceedings to a close.

The college is celebrating its tenth year by developing the new agricultural Department. Two Professors have been brought from America. One more (Prof. Slater) is B. S. A. of Toronto University from Guelph Agricultural College. Two hundred acres of land have been secured on the bank of the Jumna opposite to the College. Classes begin this year.



The Bombay Government in their resolution on hand-loom industry in the Presidency observes that the Governor in Council desires that practical demonstration of the work of improved looms should be arranged for on a more extended scale than has hitherto been possible, and his Excellency in Council is prepared to employ for the purpose more men if they can be found. The list of places where in aggregate more than 250 hand-loom are at work is appended. The Governor in Council wishes that as soon as arrangements can be made to obtain trained teachers small weaving schools should be started in each of the following districts:—Dharwar, Nasik, Bijapur, Ahmednagar and East Khandesh. The Committee of the Vic-

Hand loom
industry
in Bombay

toria Jubilee Technical Institute having agreed to the erection of a special building in the compound of the institute for starting a hand-loom weaving department and inaugurating a series of experiments in varying and sizing, the Government have sanctioned a grant of Rs. 7,500 for the erection of the building and a recurring grant of Rs. 2,000 per annum to meet the cost of working the new department. The latter is expected to start work next January.

The building for the Madhavlal Ranchhodlal Science Institute for which Sir Chinubhai Modhowlal has given a donation of six lakhs of Rupees is expected to be ready by April 1913.

The control of the Bombay Veterinary College was transferred from the Director of Public Instruction to the Director of Agriculture and that of the Grant Medical College to the Surgeon General with the Government of Bombay.

The Industrial Conference met on the 29th December 1911 in the Congress pandal Calcutta before a representative gathering. The Maharajah of Maurbhanj as Chairman of the Reception Committee opened the proceedings and in the course of his speech accorded the delegates a hearty welcome. He said that their presence emphasised the growing interest of the country in industrial enterprises, and the importance which they attached to the Conference. Without the least fear of contradiction he might affirm that the Conference had served a most useful purpose in bringing together the leaders of thought and the pioneers of industry into a fold where they could exchange their views, and give each other the benefit of experience in a friendly spirit. He said that the industrial problem was the problem of problems. In an age of scientific advancement, of keen competition in which the struggle for existence was becoming harder day by day, the question of industrial advancement must precede all other questions. Upon it depended the livelihood of the great majority of the people and the wealth and prosperity of their country. India had its industries in the past and excelled in very many of them. It had its trade and commerce, both inland and sea-borne. Continuing the speaker said that the circumstances prevailing in the past had all changed. It could no longer have an isolated and self-sufficient life. India was now a member of the international community and must take its share in the strife of commercial competition.

Sir R. N. Mookerjee then proposed and Babu Bhupendranath Basu supported the elec-

tion of the Hon. Mr. M. B. Dadabhoy as President of the Conference. Mr. Dadabhoy then delivered his address.

The President then put a resolution tendering loyal homage to their Imperial Majesties and another expressing condolence at the death of the Hon. Mr. V. Krishnaswami Iyer.

Eleven more resolutions were adopted, urging the establishment of a fully equipped polytechnic college in India, an enquiry into the causes of the failure of several industrial enterprises and the anomalous character of the existing railway rates. The Conference appointed committees to see that the Government's order for the purchase of country made articles was carried out and to offer suggestions in regard of the Credit Societies, Life Assurance and Provident Societies Bills pending in the Supreme Legislative Council. The Conference also urged for the establishment of a department of industries to introduce new methods and processes, to carry out experiments, to develop selected industries, to organise industrial and commercial exhibitions, and to establish a museum and bureau of information. The Conference urged the Government to abolish the system of Indian indentured labour. A resolution was adopted calling upon the Government and the people to encourage Indian manufactures, to utilise mineral resources, to pray for the repeal of excise duty on cotton goods, to standardise weights and measures, and to affiliate commercial colleges to the Universities. The Hon. Mr. R. N. Mudholkar was appointed as General Secretary for the next year, and Mr. N. A. Dravid and Mr. M. B. Sant as Assistant Secretaries. The Conference was then dissolved.

OTHER EDUCATIONAL ADVANCES.

The Hindu University Society has been registered under Act XXI of 1860, and its head office has been opened at Allahabad. It has already been announced that the Hon'ble Rai Bahadur Dr. Sunder Lal C. I. E. has accepted the Secretaryship. A branch office is open at Benares to answer enquiries. Local committees have been formed in most places and are being formed else-where. Gentlemen who may be willing to further the cause of the movement in their districts should obtain receipt books and copies of prospectus etc. by writing to of the Head office. Receipts are always issued to subscribers who make payments either to local committees or to the Bank of Bengal. An account of the Hindu University fund has been opened

with the Bank of Bengal at Benares and Allahabad and the Head Office of the Bank of Bengal has kindly arranged to receive subscriptions at all its branches and to transfer the same to Benares. A meeting of the committee of management is going to be held at Allahabad on January 21st at which the Maharaja of Durbhanga will preside.

His Highness the Maharaja of Alwar has promised two lakhs, the Hon. Sultan Singh five thousand, and Pandit Dargakrishan Kaul twenty-five thousand rupees to the proposed Hindu University funds. Sahu Tekchand of Hasanpur contributed Rs. 1,100 to the Hindu University.

At Sheogarh Donations to the extent of some 7,000 were promised, out of which 945 were realised in hard cash, the Raja Saheb himself donating 5,000 and his son Lala Saheb 500. With the Raja Saheb as president a local committee was then formed to continue work of the University at Sheogarh. More subscriptions are expected from Sheogarh.

At Sekandrabad (U. P.) about Rs. 4,000 was promised, of which Rs. 3,000 has been realized and sent to the Delhi branch of the Bank of the Bank of Bengal to be deposited in the account of the Hindu University fund.

A committee of the Moslem students of the United Kingdom has been making arrangements for the presentation of a casket to H. H. the Aga Khan in recognition of his services to Islam, and particularly for his recent efforts as regards the proposed Moslem University. His Highness has agreed to accept the casket with an address when he goes to England.



The cordial thanks of the Senate have been given to Mr. Martin White for the continuance of his provision for the Chair of Sociology till 1930. This chair was originally founded by Mr. White in 1907 for a period of five years. Those interested in the improvement of the race should send to Sir

E. Busk their contributions to the Galton Laboratory of Eugenics Fund. Dr. Karl Pearson, the first professor, has given £500 and our Chancellor has given £100. Several other persons of note have given similar sums towards the £15,000 required.

A donation of £1,000 has been made by Mr. and Mrs. Walter Baily, in celebration of their Golden Wedding, for the purpose of re-arranging and decorating the interior of a portion of University College; and the cordial thanks of the Senate have been conveyed to them for their munificent donation.

Among the "pious foundations" of the past a high place is occupied by Charterhouse.

Refounded on the ruins of the old monastic establishment by Thomas Sutton, the millionaire coal merchant of Queen Elizabeth's day, school and hospital have done a noble work in the last three hundred years, uniting in a common spirit both old and young, blending—as the Archbishop of Canterbury said in his admirable tercentenary sermon—"reverence for the past and welcome for the future." In proportion to its numbers Charterhouse has "given more names to the bead-roll of famous men than any other school in England or in the World. Among the three hundred who made their way on Tuesday through the famous cloisters to the dinner in the Merchant Taylors' Hall (the beautiful Elizabethan hall of the Charterhouse was too small for the great company) were men who have made their mark in every calling, such as the Lord Chief Justice, General Sir R. S. Baden-Powell, Major Prince Albert of Schleswig-Holstein, the Bishops of Gloucester and Lewes, Major-General Broadwood, and Sir K. A. Muir Mackenzie. The *Daily Chronicle* notes the absence at the dinner of representatives of "good literature"—the aim which the founder coupled with "piety"—though it was Charterhouse in the past which gave us Lovelace, Crashaw, Barrow, Addison, Steele, Wesley, Grote, and Thackeray.

The Sydney University has created three new Chairs of Political Economy and Commerce, Botany and Applied Chemistry.

The first University College for Women in Germany has just been opened at Leipsic, owing to the efforts of Frau Goldschmidt, an octogenarian lady who has been working at the scheme for forty years. In addition to the ordinary university branches of education, "home science" will be prominent in the curriculum. Success seems assured for over five hundred students have already been registered.

Gifts to the
London
University

Sydney
University

German
University
College for
Women

CONVOCATION ADDRESS

OF THE REV. J. C. R. EWING, M.A., D.D., L.L.D.
Vice-Chancellor of the Punjab University.

Lord Macaulay's famous Minute of the year 1835 marked an era in the history of the intellectual life of modern India. It was the first formal and official utterance of a purpose and plan which a variety of circumstances had conspired to render inevitable. Traditional methods of instruction, howsoever excellent, and the exclusive use of the Indian vernaculars as a medium for the dissemination of Western learning had already been recognized in certain quarters as inadequate to the demands of the time. Important work had been done by agencies other than Government in the direction of familiarizing many of the youth of the country with the language and literature of the West. The thirst for such learning had become very widespread and intense. In response to this demand and in fulfilment of what was regarded by the weightiest counsel as her duty and privilege Government formally adopted the policy of devoting public funds to the development and support of Western education. During the succeeding twenty years, the wisdom of this policy seems to have been confirmed, for it was after the experiences of such a period that a scheme, looking to the widest extension and elaboration of the system, was deliberately adopted.

In every country the people at large are vitally interested in those questions which have to do with the type and character of the education which is made available to the youth of their families. The individual not only feels that he has something of exceeding importance at stake, but in this matter he usually considers himself qualified to entertain and to give expression to very definite opinions. He does not, however, always bear in mind the consideration that skill in pointing out defects does not necessarily argue the highest type of intellectual acumen on the part of the critic. He requires sometimes to be reminded that those charged with the responsibility of providing the best possible educational facilities for the young are usually most painfully conscious of

the deficiencies which so sorely trouble him. They are seriously perplexed : the questions to be solved are complex in the extreme. They ask that the critic give his sympathetic aid in constructing something to take the place of that which he so vigorously and enthusiastically would rase to the ground.

We may not here enter upon the details of the several commissions, composed of carefully selected men, which have from time to time devoted much labour and earnest thought to a review of the entire situation, as it has undergone, in the process of time, those modifications which are inseparable from a condition where progress in all directions is as rapid as it is in India. Neither need we attempt fully to estimate the substantial value of the time and thought given to the problems connected with education by hundreds of earnest, thoughtful men, who in their places as members of the Senate of one or other of the Universities, or as officials in the Educational Department, or as bearing the responsibilities of Private or Aided Schools and Colleges, have laboured to discover what is best and to make that best available to those in whose interests they toil. Let us avoid the mistake of supposing that in this matter of supreme importance there has been any appreciable amount of idle drifting. Errors have not always been avoided, and grave questions still remain unanswered, but the difficulty lies rather in the peculiarly complex conditions in which we find ourselves, than in any failure adequately to recognize them and honestly to endeavour to meet them.

Certain of our problems are unique. They belong to the present conditions of the country, and are intimately connected, some of them, with the deepest feelings and most profound convictions of multitudes whose forefathers throughout many centuries were accustomed to reflect with extraordinary seriousness and effect upon many of the greatest problems of human life.

I

One of the characteristics of the educational situation as we have it is, of course, connected

with the circumstance that to so large an extent the medium of instruction is a language other than the mother-tongue of the pupil. It is, indeed, a fact of no small importance in its bearing upon the intellectual development of youth that practically all of them who advance beyond a very elementary degree of education do so by means of the English language, employed as the vehicle for the conveyance to their minds of whatever knowledge they are set to acquire. In the initial stages of their course of study, and even later, the entire character of their mental development must inevitably be coloured by this circumstance. This is especially true in the case of those whose immediate ancestors have not had access to the speech which is now destined to become so important a feature in the intellectual life of their children. The young man steps out into an entirely new world, and shall we wonder if he sometimes shews signs of bewilderment?

In this relation the educational history of the Panjab furnishes us with considerable material of interest. Some of the incidents associated with the Panjab University College and its ultimate transformation into the Panjab University in 1882 are still fresh in the memory of many. They illustrate the unwisdom of blindly warring against the spirit of a particular age. The theory that learning can best be imparted through the medium of the pupil's vernacular is one not likely to find many gainsayers in any age or country; nevertheless, the history of this Province has, in this connexion, added another to the many examples which make clear the truth that even the most unexceptionable of theories must yield to that which the circumstances of a place or period render inevitable. The Panjab had made up its mind as to what it wanted, and nothing short of what had been granted to three of the older Provinces could in the nature of things be regarded as satisfactory. The English language has taken its place as the most prominent of the subjects of our University curriculum. While I must profoundly deplore any tendency toward the neglect of the cultivation of the vernaculars, and would urge the

more general and thorough study of the classical languages, I nevertheless believe that this ideal may, and must be realized side by side with the fullest recognition that India's relation to the West entitles her to the fullest share in every benefit to be derived from a still deeper and wider culture through the agency of that language which is the speech of the Empire.

II

The fact that there has hitherto been no University in India exercising to any considerable extent the functions of a teaching body has very materially affected the progress of education. We may not assume that the establishment and development of the particular system which prevails has been wholly destitute of certain peculiar advantages. On the contrary having in mind the conditions which it was necessary at that time to meet, it may fairly be claimed that no other system could have operated more beneficially and with fewer incidental disadvantages than one inaugurated at the period of the founding of our earliest University.

The provisions of the Universities Act of 1904, in so far as they relate to the composition and duties of the Senate, Syndicate, Faculties and Boards of Studies are admirable. This machinery amply suffices to secure the maintenance of a fairly high standard of scholarship, and in this every believer in real education must rejoice. It is designed that our certificates and diplomas should possess, in every instance, a certain definite value. But that this ideal is in common experience realized may well be doubted. Under the prevailing system by which the qualifications of all candidates are tested, no little disadvantage results from the circumstance that ordinarily the examiner can have no personal acquaintance with the examinee and that the latter must stand or fall by what he is able to do in way of shewing his proficiency in the theme of two full years of study, during a Period of three hours' duration. The tendency is to the putting forth of a stereotyped product. The examiner knows the candidate by a number and is of necessity wholly unable to make any allowance for those individual characteristics which often

differentiate a man from a machine. As a consequence not a few of our brightest young men find themselves stranded, at some point in the course leading to the higher degrees. Their teachers recognize them as possessed of finer gifts and wider and more substantial scholarship than that possessed by the average man who satisfies the examiner ; but here the teacher has no voice and the examiner is helpless. The candidate find himself compelled to await the lapse of a full twelve month, when he again is subjected to a questioning by an examiner who has no antecedent knowledge of him, and whose personal idiosyncrasies are other than those of either his teachers or his previous examiners.

The change in the Regulations of this University according to which a candidate for the B. A. or the B. Sc. degree who is strong in two subjects but fails in one, may appear in the year following in that subject only, is an alteration upon which we may, I think, congratulate ourselves. The plan is reasonable as well as educationally sound and it affords valuable relief to those most deserving of it.

Let it not be supposed that in thus indicating some of the general disadvantages or deficiencies which are apparently inseparable from our system, any sweeping condemnation is intended or implied. The present purpose is to make clear the fact that we work amidst difficult conditions, and that the provision of an ideally perfect system is a task by no means so simple as some have seemed to imagine. In general the University pass-lists are found to be in remarkable harmony with the House Examination results in our well-conducted Schools and Colleges. There are, however, enough exceptions to justify the inclusion of our method of examining among those features of the educational system which perplex those who desire the removal of every element calculated to retard the progress of the best in education. No wholesale alteration of method is suggested or advocated by those who have intelligently studied the situation, but that, in some details, the desirability of amendment is fairly obvious will be generally admitted. Standards seem, at times, to fluctuate

most astonishingly ; but in this particular the Panjab is, by no means, the chief sinner amongst the Indian Universities ; indeed, we are rather proud of our record in this respect.

It is urged that we should have Boards of Moderators, charged with the duty of passing upon all examination questions before they are placed before the candidates, thus, obviating those evils which not infrequently arise through the individual peculiarities of examiners. It would, however, appear that we have had, as yet, no entirely practical scheme suggested by means of which this most desirable end may be realized, and at the same time all possible information as to the general or special character of the questions set should be kept from the candidates until the arrival of the hour of actual examination. This matter is of no insignificant importance. It deserves the most careful attention of the Senate, and will, I am persuaded, be given much earnest thought until a solution shall have been found. In the higher examinations, where the number of candidates is small, it has been found possible, by the appointment of joint examiners from amongst those engaged in actual teaching, to avoid some of the disadvantages of which complaint is made. It still remains to deal with this question as it affects those examinations in which the larger number of candidates appear. That this will eventually be done with a good degree of effectiveness, it is not too much to anticipate.

A suggestion was made to the Universities Commission at its sitting in Lahore in 1904, which was apparently received with little favour, and, of course, found no place in the report of the deliberations of that body. The Idea advanced was this, that adequate measures should be taken to ensure the efficiency and integrity of all Colleges and that to each should be secured by Charter the power of granting degrees. To the objection that those degrees would speedily lose all value because of the absence of restraint upon their bestowal, it was replied that the College which proved itself unwilling or unable to maintain proper standard would shortly find its lecture rooms empty and its credentials valueless. Th

one who ventured to make this suggestion was rather startled at his own temerity in making it, but that it was not of so wild a nature as at that time it appeared to some to be, has been abundantly proved by events and movements which have come into prominence since then. If Charters be granted to a Muhammadan University at Aligarh, and to a Hindu University at Benares, it is surely not inconceivable that in process of time similar privileges will be earned and obtained by other institutions. If the success anticipated by the pioneers of these movements be realized, we may I believe, confidently expect to witness a very wide extension of the general plan, so as eventually to include all higher education. The value of an academic distinction will then bear a direct relation to the character and reputation of the teaching University by which it is bestowed. A force stronger and more effective than that now exercised by any merely examining body, will come into operation, compelling the maintenance of a high standard, through the necessity for securing and permanently commanding public approval and patronage. That any such radical and general alteration in the scheme of things educational is to be a feature of the near future is in the highest degree improbable; but that we have begun to move in the direction of it is unmistakeable. When such change comes, should it ever come, we shall have to face a new series of problems, many of them quite as difficult as those that now vex us in connection with our present system. Indeed we should in the very outset, have to insist upon the most rigid and effective safeguards against every form of abuse. Apart from these any such plan is unthinkable and if introduced would be followed by disorganization and most disastrous consequences. Meanwhile we rejoice in the marvellous progress achieved within the memory of many of us. The fact that we can discern certain flaws in our machinery by no means argues its hopeless inefficiency. Great and substantial advance has characterized the educational history of the past decade, and it may fairly be claimed that in no country has this advance been more rapid and remarkable than in India.

III.

On an occasion such as the present, one may claim permission to speak, with some degree of frankness, of a matter which has throughout all the years to which reference has been made, engaged the serious thought of many, but which in more recent days has called forth a degree of interest and solicitude, amongst all sections of the people, such as was quite unknown in earlier days. The question of the moral and religious training of youth in School and College is encompassed by tremendous difficulties in every country in which personal liberty, in relation to these matters, is esteemed the heritage of each individual. But in India the normal difficulties are accentuated by unusual conditions. The principle of non-intervention in religion renders it imperative that there should be no teaching of the tenets of any particular faith in those Schools and Colleges maintained and controlled by Government. While recognizing and appreciating, at its full value, the liberality and substantial justice of this covenant, and ready to resent as a breach of faith any violation of it, the people, as a whole, are not content with the condition of things which is the logical result of the principle.

The past score of years has witnessed, in all parts of the country, the establishment of Schools and Colleges by several sections of the people, with the avowed purpose of imparting to the young the doctrines and principles of the various forms of faith which they represent. Institutions maintained and conducted by Government are doing magnificent service, and have been able largely to set the pace for others in point of equipment and general educational efficiency; but just because they are definitely representative of Government, they are restricted from taking direct part in the religious training of their students.

In very recent days we have been hearing much of the urgent need for moral training, and, in some quarters, hopes are apparently entertained that this is a thing capable of realization through a process by which the morals of the youth may be adequately cared for, without in any way trenching upon ground commonly recognized as the domain

of religion. It is not for a moment contended that great good has not been accomplished through appeals to motives and sentiments which alike find their sanction in all religions; but may it not fairly be claimed that the thoughtful young student is most unlikely to rest satisfied with that? His conduct will receive little, if any, impress from the mere knowledge that respectable people in general, including men of all religions, accept certain rules of conduct, as, upon the whole, the best and most salutary. If such rules are to mean anything of value to him in times of moral crisis, he must advance a step further, and will be heard asking why these things are supposed to be true; and it is just at this point that he requires the guidance of that teacher who has definite convictions concerning them, and who feels himself free from every restriction that would hinder the frankest and fullest presentation of his personal convictions.

The study of ethics apart from religion is, by no means, destitute of a certain value, and yet it must, I think, be admitted, that for men, as we find them in actual life, ethics cannot be separated from religion without rendering both more or less abstract and unreal.

In considering this question it is essential also to remember, that perhaps more than in any other land, religious ideals and motives give colour to the lives of the peoples of India. This is a fact which no scheme of education can afford to ignore. We must take into account the almost universal conviction of the reality of the invisible and supernatural, and upon this basis make it possible for each faith, if it will, to build and inculcate its own code of morals. Any attempt to substitute for the religious sanction, which the vast majority of the people believe to be of paramount authority, such artificial scheme of morals as would be sufficiently colourless to be acceptable to all, is doomed to fail; and even though it should succeed in obtaining general acceptance, its result would be to defeat the very purpose which we all alike aim to achieve. It is by no such procedure as this that Government Schools and Colleges can be put into a position where

those who are being educated therein may accrue, not only as they now do, the best of intellectual training, but also may come under such moral and religious influences as their parents and guardians desire for them. It has been advocated by some that the Government should gradually, but largely, withdraw from all direct control and maintenance of High Schools and Colleges, leaving this entire field to private or aided effort. We may, however, confidently assume that no such disastrous course is in contemplation. It seems to me unquestionable that the highest interests require that, for many years to come, those who have in hand the financial resources to provide the necessary machinery and the power to determine its general character, should take a conspicuous part in the further development of a system which they themselves, with the loftiest purpose, have introduced. While in increasing numbers, for reasons already indicated, students will resort to institutions maintained and controlled by private bodies, the number of those who will remain to be taught directly and exclusively by the State, will surely not decrease. As has been intimated the parents of these youth are more or less desirous that, in the process of education, attention should be given to the matter of morals and religion. That those charged with the responsibilities of the Educational Department of Government are, in general, fully alive to the importance of this question is not to be doubted, but they are not free to deal with the problems of morals in such a way as to appear to favour one or another of the several religions professed by their pupils. Is there, then, no method by which this situation may be, at least in some measure, relieved? I would venture to suggest that something substantial in the way of accomplishing what is desired might be secured through the establishment of what, for lack of a better name, we may call Denominational Hostels. A thoroughly equipped and adequately managed Hostel in the vicinity of the Government School or College furnishing a home for the students of a particular faith would probably be welcomed by the authorities of the place as a positive help. Here there would be found the most entire freedom for the leaders of

that particular community to provide whatever moral and religious instruction they might regard as of the greatest value. It need hardly be said that such an enterprise could be of appreciable value, only if most seriously undertaken. It would involve not only the expenditure of considerable sums of money, but also would depend for its success upon the moral earnestness of the men in immediate charge. But if it is not worth this expenditure, and if the best men refuse to be enthusiastically and practically interested in it, let the matter be put aside, and the talk of the paramount importance of moral and religious training cease. I am, however, convinced that some such scheme is not wholly a vision, and that in circumstances where there is present a profound conviction ready to prove itself in action, that religious and moral training are of supreme importance, great possibilities lie. It is by no means claimed that this is a solution of this great problem; at best it could only be regarded as a beginning. Obviously it could only merit even that humble designation if earnestly, efficiently and persistently undertaken and maintained. Attempted in any other spirit, such Hostels would be intolerable in the vicinity of, and in affiliation to, well-regulated Schools and Colleges, and would be a source of positive injury to those who might find residence in them.

Before leaving this difficult and perplexing topic, which I fear that I must do with the humiliating consciousness that my contribution to its elucidation has been most insignificant, a word is due to an element in the situation to which no direct reference has hitherto been made, but which is of fundamental importance. If good morals are to be taught, it is imperative that we look after the character of those who are set to teach. All are probably agreed that the mere fact that a man is conspicuous in the social life of his community, or can even discuss with fluency the tenets of his own, or another's religious creed, cannot be accepted as a guarantee of his fitness for the position of a guide and model for the young. On the other hand, let it not be supposed that we undervalue the mighty moral impulse that has many a time been due to the life and character of a teacher or professor, the

conditions of whose appointment were such as to preclude his advocacy, in his official capacity, of the principles of any particular religion. Let the teacher be one whose life is clean and strong and beautiful, and you have here a dynamic at work upon your boy more powerful than any other, save that which operates in that home where father and mother are alike qualified, through education and capacity for rightly estimating the best things, to surpass all others as guides of their own children. Where the teacher is of this type he is not so by accident. Character of this sort is not fortuitous. It is founded upon definite convictions. The student will not only admire it, but will seek to know its basis, and in process of doing so will be acquiring the sort of education which is the best of all treasure, whether it be labelled moral, or religious, or both. Indifference in a matter so vital as that of the personal character of the teacher is, of course, deplorable; but it would appear that it is by no means unusual. Ability to secure a high percentage of passes in a public examination has an unmistakeable value, but if there be an absence of all capacity to stimulate to something higher and better and more abiding than that, there is entire failure at an essential point. Furthermore, we have a right to refuse to be satisfied with mere negative qualifications. There are hosts of people who as teachers will scrupulously refrain from directly inculcating anything positively wicked but it is at the same time wholly vain to expect from them anything definitely good. We insist upon committing our youth to those whose intellectual equipment is unquestioned. We should surely be no less insistent upon their being brought into daily contact with those who through both precept and example can, and will, guide them along a pathway that leads to the noblest and best in this life and in the life that is to follow.

In conclusion, may I remind you that while suggesting certain difficulties and perplexities associated with the problem of the education of India's youth, and venturing to indicate certain lines in which improvement may be, with a degree of confidence, expected, no claim is made of having discovered any ideal or perfect order of things. The

best system of education imaginable is, and will always be, a choice between different kinds and degrees of imperfection. We seek, nevertheless, to make that choice intelligently and in a spirit of fidelity to those obligations from which there is no honourable way of escape. Reference has been made to the rapid advance which has been made. No friend of India desires to see this progress checked or retarded, howsoever keenly he may feel the importance of so guiding it that there be no issue in that which would cripple rather than strengthen. No excessive optimism is necessary to enable one to foresee and to rejoice in contemplation of the day when that enlightenment which is now the privilege of comparatively the few will be the possession of a vast multitude. Towards such a consummation the benign Government under which we dwell has led the way, and I do not, for a moment question, that ultimately the pathway, the early stages of which have thus been marked out, will lead us to a time when the inestimable blessings of moral and intellectual enlightenment will be the possession of this entire people.

KASAULI AND ITS PASTEUR INSTITUTE.

Kasauli is a small hill station and cantonment in the Punjab. It is situated in the Lower Himalayas at about 6,300 feet above sea-level. It stands on the summit of a long ridge overlooking Kalka. A good road runs from Kalka to Kasauli—all uphill and is about 9 miles long. Kasauli is in the south-west of Simla, the summer residence of the Viceroy, the distance between the two being nearly 32 miles by road.

Geographically Kasauli comes within the Simla district but for administrative purposes it belongs to the Kharar *tahsil* of the Umballa district. The management of this station is in the hands of a Cantonment Magistrate, assisted by a Cantonment Committee.

Kasauli is surrounded on all sides by Native States. It is said that it formerly belonged to the Maharaja of Patiala from whom it was taken

by the British Government for military purposes. The Cantonment was founded in the year 1842. There are several other cantonments in the neighbourhood—at Dagshai, Barogh and Sabathu. Probably all of these were established about the same time and in view of the Sikh Wars.

At present Kasauli serves more as a convalescent depot and contains a fine military Hospital. Besides other people come here specially during the summer months for a change. During that time the commissariat department and some other offices particularly military come over from Umballa. On account of the locality abounding in pine forest Kasauli is also considered sometimes as a sanitarium for phthisical patients. In winter it is very cold, the temperature reaching almost the freezing point and often the snow lies on the ground for weeks together and frost is not then very uncommon. When we went there in the beginning of February last we had to walk on snow nearly six inches deep. And although the cold was a little severe for us, the weather was exceedingly dry and we found it to be bracing. Owing to its nearness to the plains, however, Kasauli is held to be the least attractive in climate of the Punjab hill-stations.

Whatever it may have lost in its salubrity has been greatly compensated by the increase in its natural scenery. Taking your stand in the afternoon on its Southernmost peak called the Tape Nose or the Monkey Point, you can have a grand panoramic spectacle as you look round. Below you find how quickly the elevation is breaking down to the low small ranges of hills here and there on the borders of the wide expanse of a level country bounded on the other side by the distant gloom of the horizon, which reflects a shade of mysteriousness over the entire scene. By following the long circuitous and gradually widening stretches of yellow (if the season be dry), you can trace the courses of rivers as issuing out of gorges by rapid falls and proceeding solemnly and silently, as it were towards a far-off and unknown destination.

The north is no less charming than the south—although in a different way. Kasauli being

comparatively of a higher altitude commands the finest bird's eye view of the country for many a mile. At one sweep the eye can survey the innumerable chains of peaks and valleys of such wide extent that we easily imagine ourselves to be looking at a solid ocean with waves of richly variagated colours—ending on the distant north with the albin range of perpetual snow.

Inside kasauli there is almost nothing for special mention. Even with its Church, the Barracks, the Soldier's Recreation Grounds, the Bank-buildings, and the Club, it is still one of the ordinary kind of hillstations. It contains a Post Office and a Telegraph Office. Its bazar is fairly good. The shops are all owned by native merchants. Although we can have almost everything of daily necessity, the general prices of commodities are a little higher than elsewhere. The reason is that most of the things—even vegetables—come from outside and the local products are very small in number. Good table rice sells at Rs. 12/- per maund. *Dal*, *Ghee* Eggs, potatoes, cauliflowers, cabbages etc. go at Calcutta prices. Locally made flour of wheat is often preferred to the imported and you can have it very cheap—at one anna and a half per seer. Milk which is supposed to be good goes at 8 seers per Rupee. Fish comes generally from the plains and almost daily during the cold season and is sold at 6 or 7 annas per seer. Meat—goat or mutton—is exceptionally cheap and can be had all the year round. The town is supplied with good filtered water through pipes on the usual high level principle. It is also provided with an efficient drainage system and its censervancy arrangements are excellent. In a word every attempt has been made to promote the health of the place. The only point which excites in this connection an adverse remark is the nearness of the Refuge incinerator to the native quarter, where middle class Indian gentlemen have often to put up. The obnoxious fumes emitted sometimes pester the locality with a very bad smell. The attention of the authorities ought to be drawn to the necessity of removing as early as possible this recurring cause of public nuisance.

The greatest importance of the place is due to the Pasteur Institute founded in 1893 (and incorporated in 1901) for the scientific treatment of people bitten by rabid animals, and also to the Central Research Institute, established in the year 1906 with a view to provide means for the Scientific Study of the etiology and the nature of diseases in India in addition to the preparation of curative sera for the diseases of man and the training of Scientific workers. Of these Institutes the latter is of no mean interest to all medical practitioners but the former affects more directly and immediately the mass of the people. And so it is quite meet that we should enter upon a fuller description of the Pasteur Institute—its object, method of treatment and such other things that are likely to be of interest to those who have the misfortune to go there.

The Pasteur Institute undertakes to treat cases of that virulent disease which is commonly, though often wrongly, called Hydrophobia. Hydrophobia is only a Symptom of the disease, which is technically known as Rabies. All mammals are more or less subject to this terrible malady, although dogs are specially affected by it. In man it is often transmitted through biting or licking by animals having rabies. When a rabid animal bites another, it shows no immediate symptoms of the disease. The wound caused by the teeth behaves like an ordinary wound and becomes healed up in the usual manner. After the lapse of a certain period which may vary from nine or ten days to several months (generally two or three) the bitten animal exhibits certain special Symptoms of the disease. Rabies is then said to have "declared" itself and the intermediate period is called the period of Incubation.

"When the affected animal is a man, the first symptom, is usually a change of character—he becomes melancholy and distrustful. Next, generally at the beginning of the case, appears a symptom called *aerophobia*—the smallest breath of wind which touches the skin of the face caused its muscles to contract. Next comes Hydrophobia—if the sufferer is offered anything to drink his throat contracts and he suffers spasms of the pharynx.

When this symptom appears the death of the sufferer is at hand and is certain to occur in two or three days. During the interval between the appearance of Hydrophobic symptoms and death, the patient has periods of calm and accesses of fury and also exhibits paralytic symptoms which usually commence in the lower limbs." It is evident from these symptoms and signs that it is a disease connected with the nervous system and consists in an extraordinary irritation of the brain and a consequent disintegration of the nervous centres, leading to paralytic feats preliminary to death.

The ultimate origin of the disease is not yet known. It was formerly supposed to be due to an exposure to the heat of the Sun. But this theory has long been disproved, although nothing particularly has been put forward to take its place. It is, however generally held now that it is a kind of germinal disease and the germs, for want of definite determination, go by the general description of *rabie virus*. A supposition of this nature first struck M. Louis Pasteur, who thereupon set himself to study the disease in 1880. He observed that the virus was to be found in the nervous system and the saliva of the rabid animal but not in the blood, the lymph etc. In the course of his researches M. Pasteur also observed that in certain groups of animals, which had been inoculated beneath the skin with large quantities of rabie virus, some did not take rabies at all. This observation was the origin of the discovery of preventive inoculation—inoculation which renders an animal refractory to rabies.

The method of treatment, as followed at Kasauli is based on this discovery of Pasteur. It consists in injecting into the body through the navel regions by means of a hypodermic syringe a liquid prepared from the spinal cord of a rabbit that has died of rabies. This liquid is made to vary in strength in proportion to the known virulence of the nervous matter soaked in it. The treatment proceeds first by inoculating the patient with the mildest form of this serum and then gradually increasing its strength day after day, till the most virulent is reached. Under this method

there are no special prohibitions to the patients, except that, while undergoing treatment and for at least ten days after they should not use alcohol—they must not take heavy or exhausting exercise by way of long walks, dancing etc—they must not subject themselves to undue excitement of any kind and finally they should avoid sudden chills.

The treatment, it is admitted, is not curative but only preventive—in so far as it renders its subject refractory to rabies. And its success is the greater ensured, the sooner is it resorted to after the bite. Inoculations made on a patient early enough after the bite will most likely prevent rabies from declaring itself. The reason is that the virus deposited in the wound by the bite takes sometime to proceed to the nerve-centres through the nervous filaments, which it meets with there. Once these nerve-centres are affected and destroyed, no power of man can bring about a cure. Hence inoculations must begin before the virus has made considerable progress. Now the time it takes to reach the nerve-centres varies according to the number, nature and position of the wound and the circumstances under which they were inflicted. A bite through clothing for example is less dangerous than a bite on bare skin. The bites on the head on account of their proximity to the brain are more serious than bites on the limbs. And also the deeper and more numerous the wound, the more the nerve-filaments are affected and therefore the greater is the danger.

What a man, therefore, ought to do when bitten by a rabid animal is this: The wound should be cauterized with Carbolic acid or any other caustic as soon as possible and deeply so that the virus, if possible, may be destroyed before it has begun to cultivate itself in the nervous System. Then if it is certain that the animal which inflicted the bite is mad, or if there is good reason so to believe, the victim should be sent as speedily as practicable to the nearest Anti-rabic Institute. It has already been made obvious that his safety depends on the quickness with which this is done.

Doubts have often been entertained, however and sometimes not without reason, as to the efficacy of the Pasteur Method of treatment—in spite of the

opinions of the Experts who formed the English Investigation Committee of 1887. In their Report to Parliament they wrote—"It may hence be deemed certain that M. Pasteur has discovered a Method of protection from rabies comparable with that which vaccination affords against infection from small pox." And yet there is a want of faith in this new method, which accounts for the relatively slow acceptance of the treatment specially among the Indians although from the statistics of different Pasteur Institutes it appears that the failure of the treatment hardly exceeds 5 per cent. The Government of India seem to have fully recognized the merits of this new Method and have not only made the treatment free of charge but also granted both to Government servants and to indigent persons unconnected with public service certain laudable concessions to enable them to attend at the Pasteur Institute. Any indigent person unconnected with public service, for instance, is granted his actual (3rd class) travelling expenses to Kasauli and back besides a maintenance allowance in the case of Indians at the rate of 4 as a day during the journey and 6 as a day during treatment which generally takes 17 to 20 days. In addition to these certain Railway Companies likewise give concessions. Thus poor patients are granted free third class return tickets by the E. I. Ry. Co. on production of a certificate signed by a gazetted Medical officer, that they are proceeding to the Pasteur Institute, Kasauli, for treatment.

This generous encouragement has after all met with some success. There has been a considerable increase of late years in the number of patients both European and Indian. While we had been there for the treatment of my little brother we found a fair number of Bengalis, some of whom even went from such distant places as Silchar, Dibrugarh etc. with their little boys and girls. Every arrangement has been made by Government to render the journey as convenient as possible. On the outward journey people generally get down at Kalka, whence they can go by rickshaws, ponies, dandis etc. to Kasauli, for the carriage of luggage etc. coolies can be engaged at 4 as.

6 p. each per trip. A representative of the Pasteur Institute or the "Dog-Hospital" as it is locally called, is expected to be present at the Station to meet passengers of all the principal trains and to arrange for their journey uphill. The only difficulty is about lodging at Kasauli. No patients are accommodated in the Institute itself. Europeans and Eurasians may put up in the Dak Bunglow, in the Hotels and Boarding Houses and the club. For those of them who cannot pay hotel rates there is a house called "Drumbar" with five quarters, attached to and under the Superintendence of the Institute, the charges of these being Rs. 2/8 per day, everything included. For indigent Indian patients "Lines"—or rows of rooms—are provided by the Institute where they many live gratis. They are also supplied with warm clothing and, blankets, when necessary. The difficulty of accommodation therefore lies only with the Indian gentry. But funds have been raised and attempts are being made to remove this difficulty. The following extract from the Ninth Annual Report of the Institute will make this fact evident: "negotiations are in progress for the purchase of "Hardwick" and "Grange" estates with a view to the erection of a hostel for middle class Indians and quarters for the Indian nobility. When these will be completed, there will be accommodation for all classes." In the meantime we are left to make our own arrangement. Good rooms can be rented in the Bazar on reasonable terms, specially in winter, when other people do not come as in Summer. It is better under all circumstances, however, to enquire Lala Javala Pershad Chouthury of Arath Bazar, the owner of most of these rooms, whether they are available. The special advantage of engaging one of his rooms is that this gentleman renders to his tenants all possible help that we require in an unknown place. In case such rooms are not available, many people go to the *sarais*, where one room is charged at the the rate of 2 as per day and also to the Dharm-sala where residence is free but not very convenient.

Wherever they may put into, patients are to attend the Institute every morning before 10-30, when the injection commences. But for new-

comers it remains open till 3 p. m. and those who arrive still later must wait for the next morning, when they will be called in first and then other patients in a regular order, those of them who have almost finished their term being taken up last. After the completion of treatment some return for the sake of a change of route by Dharampur, a station on the Kalka-Simla Light Railway—nearly 8 miles distant from Kasauli and a little over 20 miles from Kalka. This trip is highly enjoyable not so much for the natural Scenery of the place, which is no doubt, attractive, as for the marvellous achievements of Railway Engineering.

Before concluding, however, we should also note that there is another Pasteur Institute at Connoor in the Nilgiris. That one is meant for the people of Southern India. And I believe that if the number of patients at both these Institutes increase enormously, as it ought to do, it is not much to expect that each province will have its own Institute.

S. K. BARDHAN.

ON A COMPLETE INVESTIGATION OF A PHENOMENON TAKING PLACE BEYOND THE CRITICAL ANGLE.

INTRODUCTION.

In 1897 while conducting for Dr. J. C. Bose, as his assistant, a series of experiments on electric radiation the result of which was incorporated in his paper "On the Influence of the Thickness of the Air-space on Total Reflection of Electric Waves" published in the Proceedings of the Royal Society for Nov. 1897, an idea occurred to me that if light and electric radiations were due to periodic disturbances in ether differing only in frequency we should expect a repetition of the phenomenon treated in the above paper in the case of light waves too, under favourable circumstances. I first tried to find out whether any work had been done along that line but failed to find any. Later on, April 1898, while constructing for Dr. Bose some

air-films enclosed between two microscopic cover-glasses for the determination of the index of refraction of water, I happened to make some which were found on examination to possess the property of transmitting light beyond the critical angle. Subsequently I found that the experiment was first performed by Newton¹ with two right-angled prisms of glass and afterwards by Fresnel² and recently by Quineke³ with similar prisms. As no satisfactory explanation of the phenomenon was given by any of the experimenters, I tried to explain the same by the application of Huygens's construction for wave-front. For, I argued that although in the case of total reflection no wave-front is formed in the second or rarer medium since the wave-lets starting from the several points of the bounding surface are propagated in spheres enclosed one within the other, still these wave-lets on becoming incident to a second surface separating a denser medium might become so modified as to give rise to a wave-front in that medium. But from theoretical considerations I found that no wave-front could be obtained and hence no light should be transmitted into the third medium which was contradictory to experimental evidence. Hence I was led to the conclusion that either the method of finding wave-front by Huygens's construction was faulty, or the second or rarer medium was so modified, owing to the nearness of the two surfaces, that the above failed to become applicable.

Recently I was led to adopt the mode of reasoning generally adopted by physicists to explain the phenomena of reflection and refraction and known as the principle of least time; developing which I was able to obtain conclusions which have become the subject-matter of my second, third and fourth paper. My first paper contains a detailed working of the application of Huygens's construction for wave-front for the third medium. My second paper contains an investigation respecting the paths of the incident, reflected and refracted rays proving that the paths become modified to

¹ Newton's Optics Book II, Part I. Obs. 8 and Book III, Query 29.

² Fresnel "Sur les System des Vibrations lumineuses" Bibliotheque Universelle tom XXII. See also Extract p. 12.

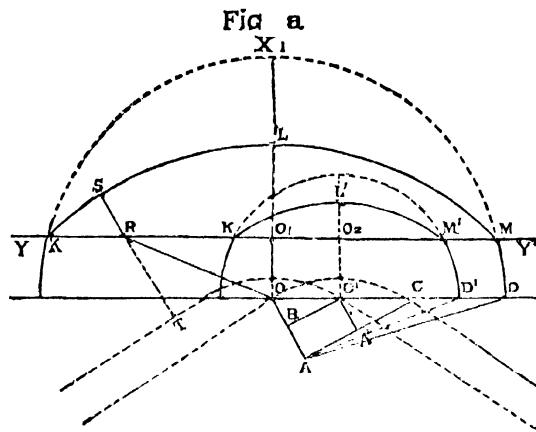
³ Mascart's Traite d'Optique tom II, P 489.

a certain extent on their approach to within a very small distance of the surface of separation of the two media, and that in the case of total reflection a path exists in the rarer medium which is elliptic, marking a limit up to which the disturbances constituting otherwise the refracted light are propagated in that medium; these disturbances being refracted back into the first medium interfere with the reflected ray and constitute what is

known as total reflection, thereby shewing that the latter is not only a phenomenon of refraction but also one of interference. My third paper treats of a complicated law of refraction as was anticipated by Fresnel.¹ My fourth or last paper consists of the explanation of the phenomenon referred to above and also of a discussion about the limiting thickness of the film.

.I

On the Application of Huygens's Construction to account for Transmission of Light beyond the Critical Angle through a Thin Film of a Rarer Medium. "



Let OA (Fig. a) be the section of a plane wave incident on XX' , the section of the surface separating two media of which the first or the lower is the more highly refracting.

The angle AOX' which the wave-front OA makes with the surface XX' is the angle of incidence. It is such that wave-lets originating at O reach D , a point in the second medium, at the instant at which those originating at A reach C . Then if a circle be described through D with O as centre it will represent the section of the secondary wave-surface in the second medium due to wave-lets originating at O at the instant at which wave-lets originating at A reach C .

Let B be a point on the wave front OA . Draw BO' parallel to AC and also draw $O'A'$ and $A'D'$ parallel to OA and AD respectively. Then if a circle be described through D' with O' as centre, it will represent the section of the secondary

wave-surface due to wave-lets originating at O at the instant at which wave-lets originating at A reach C . Thus we can draw any number of circles representing the sections of the secondary wave-surfaces due to wave-lets starting from the several points of the surface OX' at the instant at which wave-lets originating at A reach C . As these circles must lie one within the other they cannot have a common tangent and so no wave-front will be formed in the second medium.

Let YY' be the section of a second surface parallel to XX' separating a third medium for which the velocity of propagation is the same as that for the first. It is so situated that the secondary waves on becoming incident to it are refracted into the third medium. Since the wave-surfaces in this medium must not be spheres,

¹ See Extract p. 12.

their sections will no longer be circles but some other curves.

Let us next consider whether these secondary waves on being refracted into the third medium becomes so modified as to touch or intersect one another and thereby give rise to a wave-front in it.

Let S be a point in the third medium such that wave-lets originating at O reach S along the path ORS at the instant at which wave-lets originating at A reach C . The locus of S will be the section of the secondary wave in the third medium due to wave-lets proceeding from O .

It has been shewn in treatises on Optics that the locus of S is a curve parallel to a hyperbola of which O is one of the foci, YP' the conjugate axis and μ the eccentricity, where μ is the index of refraction from the second to the first or the third medium; and if T be the point of intersection of the hyperbola with SR produced, then TS is equal to AC and is normal to the hyperbola.¹

Hence, if we measure out from T along TS , a normal to the hyperbola, a length TS equal to AC , the locus of S which is therefore a curve parallel to the hyperbola will represent the section of the secondary wave surface in the third medium due to wave-lets proceeding from O at the instant at which the wave-lets starting from A reach C .

Similarly, the section of the secondary wave-surface, at the same instant, due to wave-lets proceeding from O , will be represented by a curve parallel to the lower branch of an equal hyperbola of which O' is one of the foci, it being likewise the locus of a point on the normal to this hyperbola the distance of which from the point of intersection is equal to $A'C$. The difference between the heights of the vertices of these two curves from XX' or YY' is therefore equal to AA' .

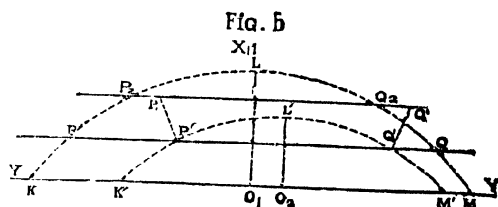
Hence the section of the secondary wave-surfaces in the third medium due to wave-lets starting from the several points of the surface OX' are curves generated by measuring out lengths proportional to the respective distances of the points from C along the normals to the lower branches of equal hyperbolas of which the points in question are one set of foci.

To investigate whether the secondary waves in the third medium reinforce one another so as to form a wave-front in that medium or not, we are to find the equation to the envelope of the curves representing their sections. But as the equation to these curves is of the eighth degree,² it will be a long and tedious process to work that out. We can, however, by means of a simple test find whether they can have an envelope or not.

If we can shew that the above curves have any tendency to intersect one another they will have a real envelope, if otherwise, they will fail to have any.

We know from the properties of a hyperbola, that its tangent makes an angle with the transverse axis, which diminishes continuously as the point of contact is moved away from the vertex, until it attains a limiting value when the point is taken at an infinite distance and the tangent then becomes an asymptote to the curve. The normal through the point of contact makes, conversely, with that axis an angle which increases continuously as the point is moved away from the vertex until it attains its limiting value when the point is taken at infinity.

The above remark is also true for curves that are parallel to a hyperbola. For the same straight line which is normal to the hyperbola is also a normal to these curves and hence the tangents at the points of intersection of a normal with the hyperbola and any of its parallel curves are parallel and are therefore equally inclined to the transverse axis.



Let KLM and $K'I'M'$ (Figs. *a* and *b*) represent the sections of the secondary wave-surfaces in the third medium due to wave-lets originating at O and O' respectively. Let YY' be the axis of y and let O_1X_1 normal through O .

be the axis of x , this being also the axis of KLM . Let PQ (Fig. 6) be an ordinate intersecting both the curves at P, Q and P', Q' , respectively. Since the difference between the height of the vertices of the curves from XY has been shewn to be equal to AA , if we measure out from P' and Q' lengths $P'P_1$ and $Q'Q_1$ respectively equal to AA along the normals through P' and Q' , the line $P_2P_1Q_2Q_1$ passing through P_1 and Q_1 is an ordinate to KLM , and each of the lengths P_2P_1 and Q_2Q_1 is equal to O_1O_2 . Hence, if the curves be so displaced that their axes O_1L and O_2L become coincident, the point O_1 coinciding with the point O_2 , the points P_2 and Q_2 will also become coincident with the points P_1 and Q_1 respectively, and therefore the tangents through P_2 and Q_2 are parallel to tangents through P' and Q' respectively. As the ordinate PQ is situated at a greater distance from the vertex L of KLM than the ordinate P_2Q_2 , the angles which the tangents through P and Q make with the axis of x are respectively greater than the angles which the tangents through P_2 and Q_2 or through P' and Q' make with the same axis, the angles being measured in the positive direction, that is to say, measured, counter-clockwise. If θ and θ' be the angles which the tangents through P and P' make respectively with the axis of x then $2\pi - \theta$ and $2\pi - \theta'$ are the angles which the tangents through Q and Q' make respectively with the same axis. Since each of the angles θ and θ' is greater than 90° both $\tan \theta$ and $\tan \theta'$ are negative, and since θ is greater than θ' , $\tan \theta - \tan \theta'$ is positive.

Let $u = \phi(x)$ and $y = f(x)$ be the equations of the curves KLM and $K'L'M'$ respectively. Then $u - y = \phi(x) - f(x)$ and differentiating with respect to x we have $\frac{d(u-y)}{dx} = \phi'(x) - f'(x)$.

When $u - y$ denotes PP' , $\phi'(x) - f'(x) = \tan \theta - \tan \theta'$ which is positive.

When $u - y$ denotes QQ' , $\phi'(x) - f'(x) = \tan(2\pi - \theta) - \tan(2\pi - \theta') = \tan \theta - \tan \theta'$ which is positive.

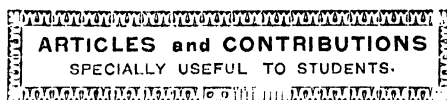
Since the differential coefficient of $u - y$ is positive the function is of increasing order of magnitude as x increases. Hence the intercepts PP'

and QQ' increase continuously as PQ is moved away from O . Hence the curve $K'L'M'$ lies wholly within the curve KLM and they therefore can never intersect each other. The same is true for the rest of the system and so no wave-front can be formed in the third medium.

Thus, we find, that Huygens's construction although based on the wave-theory of light is incompetent to explain the phenomenon of transmission of light beyond the critical angle. The reason for the deficiency will be explained later on¹

(To be continued.)

J. RAY.



SYLLABUS OF MORAL PHILOSOPHY.

INTRODUCTION.

Ethics is a science that has reference to the life of man, which is a life of action and the human activities form the subject matter of the science of Ethics and these activities, however, have many aspects: Man is partly material and so is subject to the laws of the material world, he is a spirit, a pure being and is manifested in the states of consciousness and the nature of being of man as being forms the subject matter of metaphysics. The connection is close between Ethics and metaphysics, for the hope and fear that morality excites within us can be fulfilled only in an after life, which the immortal soul alone can enjoy. Hence the nature of the soul and its destiny should be carefully studied, if man's moral nature and its possibilities are to be clearly understood. Again man grows with society of which he forms an integral member, the moral life is also social, these two have grown together and can have no independent and separate existences. Thus Ethics comes into a close relation with

¹ See "Concluding Remarks."

sociology. Man is a political animal too. Every individual ought to be a good citizen. To be a good citizen one must also be moral, the conduct of the good citizen is moral conduct. Lastly Ethical facts are facts of consciousness whether conduct is regarded from the stand point of sociology or Biology or Politics. Moral valuation is internal, is a psychological fact. Morality is subjective.

Man has an irresistible tendency to approve, disapproved of, to pass judgments upon, the actions of himself and of his fellowmen and to call some actions right and others wrong and Ethics has to explain the nature and use of the distinctions of right and wrong, to account for the fact that man pass moral judgments, judgments of right and wrong. Moral judgment is the primordial fact, the subject matter of the science of Ethics. Judgment is an operation of the mind and analysis of moral judgment is only an introspective analysis of the moral phenomenon. The judgment is a special operation of the mind, it is the activity or the self in a special direction and the self so acting is the moral faculty. Judgment is directed upon its proper objects, conduct and character of man which must be carefully studied. Conduct that we judge is found not to be isolated actions of the individual. Each action is related to every other, each while seeking its own end must at the same time contribute to the realisation of the ends of the rest and in fact of the whole. The voluntary action that forms the object of moral judgment is national conduct, it is the action of one self which must aim at one supreme end only. Desultory, aimless conduct is possible to the irrational animals only. The conduct of man must be rational, must be organised, organisation of conduct, directing all the actions towards one end, to make one consistent life possible, to satisfy the demand of one self, is to organise the several activities running apparently in diverse channels. Organisation of the external actions is possible only by a similar organisation of the internal impulses and desires from which the several actions spring. For the sake of consistent action, then, a subordination

and superordination of the actions and their springs is essential. Man acts always to attain something, the absence of which he feels and by securing which he hopes to satisfy himself. Every action of man looks forward to an end, naturally, therefore, the question arises as to the nature of the end. Each action has its own end, and the end is also a good. We act to realise a good and of the several goods, there is one that is supreme, which is the highest good or the ultimate end of action. Moral judgment like other judgments is essentially an act of comparison and comparison involves a standard of comparison, the standard of right and wrong. Thus we see that the question of moral judgments gives rise to these important problems: what is the object of moral judgment? What is the nature of the faculty which passes moral judgments? What is the standard of judgment? What is meant by the moral ideal or the ultimate good? What is the nature of moral obligation and sentiments which accompany moral judgments? What is the cause of the divergence in moral opinions? What is the origin of moral sentiments, of feelings of approbation and disapprobation? What is the source of moral authority? What is meant by right, merit and responsibility? and so on.

At the outset the definition of ethics should be given, so that the sphere of investigation, the facts that from the subject-matter of the science may be known with clearness and precision. Ethics may be defined in three different ways, as concerned with the idea of right, as concerned with character and conduct and as concerned with growth of conduct. Ethics, as concerned with the idea of right, is the theory of the distinction of right and wrong as applicable to the voluntary action of man; as concerned with character and conduct, it is a theory of human character and conduct as expression of of character, and as concerned with the growth of conduct, it may be defined either with H. Spencer as 'the theory of conduct in the final stages of evolution' or with Seth as 'an enquiring into the central principle of a man's moral and spiritual life'.

But in order to understand the above definitions

The starting point of Ethics and its important problems

Definitions of Ethics

we should consider the different meanings of character and conduct. The term character might be interpreted in five different ways: it may mean 'any sort of marked difference in mental qualities', it may mean 'any special tendency, primitive or acquired, to act in some particular way'; it may mean 'the voluntary disposition manifested in an act done with conscious purpose'; it may mean 'the voluntary disposition of a man as a whole, the settled habits of will which are manifested in a man's consciously purposive actions taken together, and lastly it may mean also, morally good character. But when we say that Ethics is the theory of character, we use it in one of the last three senses. The term conduct also admits of at least, four different interpretations: It may mean any kind of living action and in this sense it would include the conduct of a plant also and perhaps of inanimate objects too; for, recent researches prove that there is nothing lifeless in this universe—even inorganic matter shows signs of life. However, Ethics has nothing to do with such conduct. It may mean any sort of conscious action which also does not come within the province of Ethics. But conduct as an action done with a conscious purpose or conduct as a 'continuous and connected series of consciously purposive actions, viewed as the outcome of a certain habit of will or type of character' forms the real subject matter of ethical investigation.

But how conduct as a connected series of purposive actions can be made the object of ethical study? Is not such conduct inconsistent with free-will? Should we be held responsible for an action which is the outcome of habit and over which apparently we have no control? You may hold me responsible for the previous purposive actions which formed my habit, but are you justified in holding me responsible for an action which follows from the habit of will or type of character? As a matter of fact, in theory we condemn a fault, *e. g.* getting drunk, on the belief that his will being free, the man could avoid getting drunk, but in practice we do not believe that the man is likely in future

to avoid the fault which is the outcome of his past actions taken as a whole.

Every action of man cannot be called his conduct, only those actions, which are performed not unconsciously but with consciousness, not automatically but with purpose *i. e.* voluntary actions alone can properly be called conduct. Conduct, though not identical with character, is closely related to it. Conduct and character are but the external and internal aspects of the same self. Conduct is the outward expression of the inward disposition or character. Character is the possibility of conduct while conduct is the actual manifestation of character.

Conduct grows and develops and the following stages in its growth may be marked off: There is the stage of pure instinct and impulse which is the stage of simple action; then conflict comes in between impulse and impulse and this is the stage of complex action; then comes the stage of self-controlled action in which the self intervenes to control and regulate its desires according to some plan or purpose of life and lastly in the final stage the action of self becomes subordinated to one single end. Spencer supposes that conduct can be unified in the end only in one way and that must be the right way. Seth is of opinion that all actions of man can be subordinated to one end and it is the business of Ethics to find out that ultimate end which cannot be subordinated to any other end.

We see, then, that the problem of Ethics may be defined in three different ways. We may say that Ethics deals with actions, with their rightness or wrongness, that it determines scientifically what is good and bad in character which gives rise to outward actions and that it deals with the ultimate or highest good towards which the actions are directed. But these statements of the problem of Moral Science are almost identical, for, the three aspects of every rational action—its outward conduct, its inner spring and its ultimate end—are so interdependent and inter-related

Different meanings of character and conduct

Relation of conduct and character

Stages in the growth of conduct

Conduct and free-will

Definitions of Ethics and their relation

that the goodness or badness of one depends on that of the other.

(To be continued.)

C. C. SINHA.

PROBLEMS

ERRATA.

The last but one line of the proof of Quest. 4 in Collegian No. 5

$$\text{also } \frac{GD}{FG} = \frac{GE}{AE} "$$

is evidently a misprint for

$$\text{also } \frac{GD}{FD} = \frac{GE}{AE} .$$

There are also three misprints in the solution of Quest. 9. viz.

GC for GE in the fourth line

AC for BC in the fifth line

BH for BA in the sixth line

25. If S_1, S_2, S_3, S_4 are diametrically opposite points with respect to the common point S of the four circles circumscribing the four triangles formed by two pairs of intersecting straight lines; prove that the Simson lines of S_1, S_2, S_3 and S_4 are perpendicular to the line of collinearity of the orthocentres of the four triangles.

26. Shew how to trisect any given angle with the mechanical aid of a graduated ruler and give its geometrical proof.

27. Find the area of a triangle in terms of its perpendiculars (By first book methods)

28. Inscribe a square in given quadrilateral. (By Euc. Bk. III.)

29. Given the vertical angle of a triangle, its altitude and the difference of the sides containing the vertical angle, construct it.

30. The area of an equilateral triangle on the hypotenuse of a right angled triangle is equal to the sum of the areas of the equilateral triangles on its sides.

(By first book methods, without the help of Euc. I-47.)

31. Construct a square whose area will be one-fifth of a given square.

(By first book methods.)

32. Bisect the area of a given triangle by a straight line drawn through a given point in its plane.

33. A triangle ABC is right angled at B , and D a point in BC produced. If CB be the perpendicular on AD prove that

$$\frac{CE}{AE} = \frac{\frac{AB}{BC} - \frac{AB}{BD}}{1 + \frac{AB^2}{BC \cdot BD}}$$

34. ABC is a triangle and AD, BE, CF are drawn perpendiculars from the vertices to the opposite sides. If P, R, S are the middle points of FE, FD, DE prove that AP, BR and CS meet in a point.

35. The sides of the triangle PRS in Question 34 intersect the sides of the triangle ABC in six concyclic points.

36. Prove that the centre of the circle in Question 35 is the incentre of the triangle PRS Question 34.

37. A transversal cuts the sides BC, CA, AB of a triangle ABC in three points X, Y, Z . If X^1, Y^1, Z^1 be three points on BC, CA, AB such that $AX, AX^1; BY, BY^1; CZ, CZ^1$ make equal angles with the bisectors of the angles CAB, ABC, BCA respectively prove that X^1, Y^1, Z^1 lie on a straight line.

[KESHIAB DASS DE.]

REVIEWS

BOOKS.

The Realm of Ends, or Pluralism and Theism : The Gifford Lectures delivered in the University of St. Andrews in the years 1907-10. By James Ward LL. D., D. Sc. Professor of Mental Philo-

sophy in the University of Cambridge. (Cambridge. At the University Press) Price 12s. 6d. net.

We cannot too adequately praise Dr. Ward's work. We are attracted by the lucidity with which he expresses views and connections and results, we are fascinated by the thoroughness with which every point and every problem and every possibility is treated, we are delighted, as well as convinced, by the facility and the felicity with which Dr. Ward adduces illustrations from the most varied fields of thought—economics, biology, mechanics, psychology, and the history of religion. But the writer's most remarkable faculty is, it seems to us, none of these, but a subtle sense of value, which enables him to point out what the important element is in each of the complicated sets of phenomena discussed. It is not a system but a man that we meet in these pages. We are irresistibly reminded of what Professor Stout said: "Dr. Ward never allows the views of others, or even his own, to mask for him what Ferrier calls the 'flesh and blood face' of living problems. While eager to use all available help and guidance, he is yet always wrestling with real questions as they arise directly from the nature of things."

Shakespeare: a Study. By Darrell Figgis (London J. M. Dent and Sons) Price 5s. net.

The book is an excellent production of the present times. Mr. Figgis deals with Shakespeare's biography in the introductory pages (better if he had done it at the end). After showing how the nature of Shakespeare's Stage has influenced the text of his plays, the author devotes two interesting chapters to his Craft and Art. He concludes in a chapter on Shakespeare's Personality where he brings together all the threads of his book and shows what they tell us of Shakespeare's character and compares these results with the indication of the Sonnets.

The History of the Silhouettes. By E. Nevill Jackson (The Connoisseur Offices) Price 10s. 6d. net.

This handsome volume, profusely illustrated and written in good style is extremely interesting being "the first book ever issued dealing with this fascinating subject." Mrs. Jackson must be given the credit of getting together a good deal of information relative to the history, progress and decline of the cut of Silhouette "the step-sister of photography the poor relation of the art world". The book is valuable as a work of reference and the author has collected material from notable works.

The Coming of the Saints. By John W. Taylor. (London: Methuen and Co.) 5s. net.

This charming book provides matter for delightful study and will be much appreciated by everybody taking interest in the value of tradition. The author has skilfully gathered a long list of legends concerning the Saints of the first century, the relations, friends and disciples of Christ. He avoids any controversy, for, as he well says "the bloom of the rosepetal belongs to the heart of the perfume-seller." In their main features the earliest traditions do not contradict themselves, and, though they may seem romantic, they have a value which even the scientific historian would be unwise altogether to neglect.

The Man in the Shadow. By Richard Washburn Child. (London: Macmillan and Co.) Price 6s.

In this book, Mr. Child has kept up his reputation as a first class master of short stories. With his characteristic manner, the author makes it impossible for the reader to lay the book down until he has read through to the end. Mr. Child is in his best form in this book as regards his *treatment* of human nature.

Salvador of the Twentieth Century. By Percy F. Martin. Illustrated. (London: Edward Arnold.) 15s. net.

This book will be greatly valued by those who are interested in the progress of the small

Republican States of Central America. We would recommend this twentieth century record most strongly to the business men of speculation who wish to consider Salvador seriously—i. e. not in the light of a casual reader of travels. In these pages we find that the author has taken great pains in giving statistical account of the State of San Salvador. Mr. Martin is favourably impressed with the country and gives us a concise comprehensive statement of its financial position and precise analysis of its industries. It contains portraits of gentlemen who control industries and State Departments.

A Text Book of Geography. By G. Cecil Fry M. Sc. (London : W. B. Clive, University Tutorial Press) Price 4s 6d.

A second edition—revised and enlarged—of a manual which has already been of great service to the Matric students. A feature of the present edition is the new appendix of some 350 matriculation and other examination questions on the twenty chapters of the book.

PERIODICALS.

Academy and Literature. The South American Number.

It is full of matters of useful information. The number opens with a preliminary notice, treating in outline of the growth of South America. *Bolivia and its prospects, Some Peruvian Industries, and Argentine Estancias,* are some of the typical contributions. There is an article on the naval development of South America, and also one relating to the extension of press. *Through the Heart of South America* gives in a fascinating style, description of a journey through South America, which the writer divides into three convenient parts.

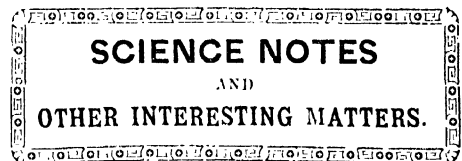
The Irish Educational Review, December 1911.
The instalment of *Mixed Education* issued

in the present number is an ably written article, dealing with the question of mixing secular with religious education. The writer shows that "the principles of the Catholic Church in Early Ages are identical with those of our own time." The system of discipline prevalent in the schools of U. S. A. forms the subject matter of another excellent contribution. *Kantianism* gives in a general and popular manner, an idea of the Kantian System of Philosophy.

History and the formation of character is a thoughtful and highly instructive paper dealing with the "influence of history teaching upon the child mind."

Indian Review. Coronation Number (Nov. and Dec. 1911.)

It is a big volume with numerous portraits, illustrations and cartoons. A special feature is the collection of articles on the different historic coronations of Aurangzeb, Jehangir, Shivaji and ancient Hindu kings of India—from the pens of contributors of tried worth, e.g. Prof. Jadunath Sarkar. "Delhi, then and Now" gives us in a short compass all that an ordinary inquisitive person likes to know of the would-be Imperial Capital of India. Besides there are other interesting articles and cuttings.



Nickel as a substitute for paper is Thomas A. Edison's solution of the problem of disappearing forests, and the consequent increase of the price of the raw material of books.

Discussing his latest discovery the other day, the inventor of the phonograph said :—"By an electro-chemical process I can make sheets of steel copper, or nickel that will absorb printers' ink. Of the three metals I consider nickel to be

the best substitute for paper. It is possible to produce a sheet of this metal one twenty-thousandth of an inch in thickness, and make it cheaper, tougher, and more flexible than ordinary book paper."

The full force of this discovery can hardly be appreciated. At present the finest India paper runs 1,500 pages to the inch, while ordinary book paper runs 350 pages to the inch. Nickel sheets, again can be made so amazingly thin as to take 20,000 of them to equal the thickness of an inch.

Going on to describe his process, Mr. Edison said that the nickel sheets "will absorb ink the same as paper." The ink would possibly have to be of somewhat different ingredients than that in use, at the present, although the latter makes a perfectly good impression on nickel, but that would be only a minor problem which the ink manufacturers could easily solve. The nickel sheets can absorb any colour, and it would bring out the same shades as half-tones do on fine calendered paper. So whatever is printed on paper, be it type, illustrations, or colour work can be printed on nickel."

"The cost of the manufacture on a small scale is 7s. a pound, but I believe that this could be reduced to 4s a pound were the nickel sheets to be manufactured in rolls in large quantities."

The electrical current deposits on a prepared base one twenty thousandth of an inch of nickel in a minute and a half.

Mr. Edison spoke of the convenience that we would find in the small size of nickel books. He said :—

"A Bible of this metal could be made the size of a match box, and carried easily in the vest pocket. Webster's standard or complete dictionary, which has a thickness of about six inches, could be condensed into a book smaller than a brick, and be carried, with plenty of room to spare, in the coat pocket, if the volume had nickel leaves. A lawyer could slip the law records of a hundred years under his arm and carry them to and from Court without inconvenience."

One of the most interesting ways of separating the gases of the atmosphere is that of fractional distillation; and the method is now of commercial importance. Liquid air, which can be purchased at quite a moderate price, is mainly a mixture of nitrogen and oxygen in about equal proportions. As nitrogen boils at a lower temperature than oxygen, the former evaporates faster, and the residue is very rich in oxygen. The manufacturer uses both the first fractions of the distillate, which has a commercial value as almost pure nitrogen, and the liquid residue, which yields purer oxygen than is obtained by Brin's process. On November 9, Sir J. Dewar described to the Royal Society the production of solid oxygen, and one can hardly refrain from speculation as to the possible utilities latent in this interesting substance.

Liquid and
Solid Air

SPORTING.

CRICKET.

*Calcutta Presidency College vs.
Bombay Elphinstone College.*

This two-days fixture bet. the premier Colleges of the two presidencies was concluded on 25th December 1911 at Calcutta, the Bombay visitors winning by the big margin of an innings and 61 runs. Scores :—Elphinstone College 230 (Mulla—80). Presidency College 1st innings 81 (Mr. Oaten, 19); 2nd innings 90 (J. Roy—32, Bose—22).

C. C. C. vs. Elphinstone College.

A full-day fixture was played off at the Eden Gardens, Calcutta, on 27th December 1911 when a very close game, watched by a fairly large crowd resulted in the victory of the home team (Calcutta C. C.) by the narrow margin of 3 runs. Scores :—Elphinstone College, 200 (all wickets). C. C. C.—203 (8 wickets; Bocquet 93).

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Vol. 1 THE COLLEGIAN No. 8

An All-India Journal of Education.

CALCUTTA, WEDNESDAY 31ST JANUARY, 1912

The announcement made by the Hon'ble Mr. Butler, in reply to Mr. Gokhale's question in the Imperial Legislative Council, that the grant of Rs. 50 lakhs for popular education will be an annually recurring grant has set at rest all doubts as to whether this grant would be cure for all or a recurring charge on the treasury. In a big country like India where popular education has not made any substantial progress, fifty lakhs of rupees given once for all, it was thought, would not bring about any appreciable result. The situation is such that even an annual recurring charge will not touch its fringe. Naturally, therefore the public expected an announcement, and Mr. Gokhale is to be congratulated on having elicited the reply from the Government which has given great satisfaction to the public. The beginning made by the Government in the direction of putting truly popular education on a firm basis is assuring and satisfactory; and it is earnestly to be hoped that as years go on the policy just announced will be more and more liberalised. On the whole, we have no room for despair, and this is a result on which we have every reason to congratulate ourselves.

* * *

We congratulate Mr. Khitish Chandra Sen on his winning one of the "Blue-Ribbons" of the University world at Cambridge—the Members' prize for an English Essay. This is the first time that this prize has been awarded to an Indian. Our contemporary the *Nation* says "To win such a prize when the essayist writes in

his mother tongue is to win great distinction but when the coveted honour falls to one who writes in a language learned after he had begun to speak in his mother tongue, one can only express amazement. Mr. Sen deserves and has received the highest compliments; his country men will not be behind his English friends in testifying to their appreciation of the honour he has won for Bengal and for India."

* * *

We regret to record the death of Sir John Jenkins, Home member of the Government of India and Vice President of the Imperial Legislative Council on Saturday afternoon at 7-25 p. m., the 13th inst. The deceased would have shortly retired from service and have joined the Council of the Secretary of State for India.

* * *

It is with a feeling of profound regret that we have to record the death of Rai Bahadur Lala Lal Chand at Lahore on January 18th at 1-30 p. m. The deceased was the recognised leader of the Vakil bar in the Punjab and some years ago acted as additional Judge of the Chief Court. He was one of the founders of the Punjab Hindu Sabha and presided at its last sessions at Amritsar. He was also president of the Managing Committee of the Dayanand Anglo-Vedic College, Lahore. He presided at the first Punjab Provincial Conference, and in later years he stood whole-heartedly for the Hindu Sabha movement. He was a prominent supporter of the Hindu university scheme. He was aged about sixty at the time of his death. The Chief Court, the Dayanand Anglo-Vedic College and other schools were closed as soon as the report of Rai Bahadur Lala Lalchand's death reached them. The bier was followed by immense number of people including all the Hon. Judges of the Chief Court.

* * *

His Highness the Begum of Bhopal who presided at the Anglo-Oriental Educational Conference delivered a most interesting address on Muslim Education of Mahomedan women in India. The address is a thoughtful and reasoned contribution to the subject of Mahomedan female education and all well-wishers of the Maho-

medan community cannot do better than carefully read her remarkable address which covered a very wide ground. While gratefully acknowledging the efforts made by the male members of the community to spread female education among their co-religionists Her Highness very shrewdly observed that those whom the male section of the community wished to advance are very weak and the goal still far distant while the need for help and earnest endeavours is most urgent. How true her words are in this respect will be readily admitted by those possessing any degree of acquaintance with the backward condition of the Mahomedan ladies from an educational point of view. Her Highness's eloquent words ought to serve as an incentive to those already engaged in this noble cause. With two such munificent patrons of learning among the Mahomedan rulers in this country like the Nizam of Hyderabad and the Begum of Bhopal the future educational outlook of the Indian Mahomedans is one full of promise.

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THE KRISHNASAWMI IYER memorial meeting in the Banqueting Hall of Government House, Madras, on Tuesday the Krishnasawmy Iyer Memorial the 16th inst. was a complete success. His Excellency the Governor honoured the memory of the distinguished deceased by presiding over the meeting and glowing appreciations were delivered by his two colleagues in the Government—Sir Murray Hammick and the Hon. Mr. Atkinson—as well as by the Lord Bishop, Sir S. Subramania Iyer and Mr. Justice Sundara Aiyar. It was resolved almost unanimously to erect a statue of Mr. Krishnasawmi Iyer and over Rs. 20,000 were subscribed. His Excellency the Governor himself was among the subscribers.

* * *

At the Mary Carpenter Hall Calcutta on the evening of the 17th instant there was a large gathering of orthodox Hindu ladies to hear a lecture delivered by Miss Tennant on female education. Rani Bindubashini Chowdhurani of Santosh presided. Miss Tennant in the course of her speech said:—In social life, the woman of India have to a certain extent enjoyed some liberty. But in educational advancement, there is much deficiency. It must be admitted that you have

Hindu Ladies
and female
education

The Begum
of Bhopal and
Muslim
Female
Education

had very little encouragement from the male members of your family. It has been claimed by some that woman should avoid higher education because they have less abilities than men, but in making this plea for female education we are not advocating that public positions should be filled by women, but in cultivating the mind every girl would not only occupy a better position in society, but she would be more fitted to become a competent mother. There is no hesitancy on the part of the parents to educate the boy, but the education of the girls of India have for centuries been sadly neglected. I do not mean that they should speak English or adopt Western ideas or customs, but that they should have a general educational training to fit them for life's battle, an education by which they may become versed not only in school training but in music, painting, needlework, and cooking.

* * *

A preliminary meeting of the forthcoming All-Bengal Hindu Educational Conference was held on the 25th instant at the Calcutta Indian Association rooms at 3 o'clock. Babu Surendra Nath Banerjee was in the chair and the meeting was attended by representatives of more than 30 castes. It was settled that the All-Bengal Hindu Educational Conference should have its first session at Calcutta on the 25th of February next. An executive committee was formed consisting of representatives of the various castes of Bengal Hindus with Babu Surendra Nath Banerjee and Lt.-Col. U. N. Mukherjee, as Secretaries. The executive committee will meet every Saturday, in order to settle the details of the conference and to push on preparations.

* * *

An important act of kindness on the part of their Majesties prior to their leaving the shores of India was the despatch of their signed Portraits to the Central Hindu College and the M.A.O. College Aligarh. At both these institutions meetings were held to send grateful and loyal thanks for the gifts. It will be remembered that six years ago as Prince and Princes of Wales their Majesties visited Central Hindu College and on that occasion as a sign of remembrance sent to the College

their signed Portraits which as Mrs. Besant remarked were their most treasured presents.

* * *

After having served the Travancore State for more than 22 years meritoriously and disinterestedly mending and framing up education in all its vicissitudes as a professor, Principal, Educational Secretary and lastly as the Director of Public Instruction the able Doctor has been pleased to retire from service. A public meeting of his students and friends was held in H.H. the Maharaja's College Hall at 5 p. m. on Wednesday the 10th instant. Dewan Bhadur P. Rajagopalachari the Dewan and other high officials of the state were present. It was settled that a farewell address and a suitable souvenir be presented to Dr. Mitchell on the eve of his departure to England, that an oil-painting of his likeness be put up in the Maharaja's College Hall and that a scholarship in his name be founded.

His Honour the Lieutenant-Governor has been pleased to make a donation of Rs. 500 to the institute for purchasing books and necessary book cases.

Dr. Indumadhab Mallick, delivered a lecture on the health of our student community under the auspices of the above institute on Wednesday evening the 17th inst. Col. G.F.A. Harris, Inspector-General of Civil Hospitals Bengal presided and the meeting was well attended. Dr. Mallick lamented the decline of the health of the Indian student community in general and attributed it to use of adulterated food stuffs, early marriage, rigorous examinations and various other causes. Col. Harris pointed out the lack of proteid substance in Indian diet.

* * *

A Distinguished American gentleman, the Rev. G.W. Knox D. D. L. L. D., is now in Calcutta and delivering lectures at the Y. M. C. A. On Tuesday the 23rd January under the Presidency of Mr. Sarada Charan Mitra Dr. Knox delivered an interesting address on the "Transformation of Japan." Dr. Knox is a professor in the Union Theological Seminary of New York, and possesses great

influence as a thinker and writer. He is a profound student of philosophy in its most fundamental problems as well as thoroughly acquainted with the various religions of the world. He spent 14 years in Japan as a Professor of Theology and for a part of that time was also Professor of Philosophy in the Tokyo University, and so is intimate with Japanese thought and life.



CALCUTTA UNIVERSITY

His Excellency the Chancellor of the Calcutta University is pleased to nominate Rai Bhagavati Sahay Sahib, M.A., B.L., to be an Ordinary Fellow of the Calcutta University.

Two post-graduate Research Scholarships of the monthly value of Rs. 100 each, and tenable for a maximum period of three years, but in the first instance for one year only, will be awarded early in the year 1912, by the Government of Bengal. No candidate will be considered eligible who has not passed the M.A., the M.Sc., the M.D., the D.L., or the Master in Engineering Examination of the Calcutta University in 1909, 1910 or 1911, or who is not possessed of high qualifications, and who cannot show that he has a capacity for original research.

The annual meeting of the Senate of the Calcutta University was held at the Senate House on Saturday, the 27th instant. The agenda included the election of four representatives on the Syndicate, the re-appointment of Dr. Thibaut as Registrar for another period of five years and of Dr. P.K. Roy as the University Inspector of Colleges and the constitution of the Faculties of Arts, Science, Law, Medicine and Engineering.

Mr. Manmatha Nath Ray and Mr. Hemendra K. Sen Gupta have just been awarded the Premchand Raychand Studentships of the Calcutta University—the former in Mathematics and the latter in Chemistry.

The Calcutta University has prescribed a Bengali book called Tarkavijnana, for the Intermediate examination in Arts. This is a new departure which is fraught with immense good. It is hoped that Bengali Professors will ere long write scientific, philosophical and historical books in vernacular with a view to their adoption as text-books by the University. The problem of higher education in India could not be solved as long as a difficult foreign language remained the medium of instruction in the Universities. It is owing to the great interest of the Vice-Chancellor Sir Asutosh Mukherji, Kt, in the cause of the Vernaculars, that such a welcome change of policy could take place in our Conservative University. Another interesting feature of the new list of University text-books is the fact that several books written by Indians, such as Dr. P.C. Ray's two books on Chemistry, Mr. Saha's Practical Chemistry, Mr. De's Practical Physics and Dr. Mallik's Dynamics have deservedly found a place therein.

MADRAS UNIVERSITY.

TEXT BOOKS FOR INTERMEDIATE EXAMINATIONS
IN ARIS, 1914.

English.—Detailed study: Shakespeare: Henry V. Milton: Paradise Lost, Book II Coleridge: The Ancient Mariner. Matthew Arnold: Balder Dead, The Forsaken Merman. Boswell's Life of Johnson, 1763—1767, Blackie's English Texts. Nineteenth Century Prose: By J. H. Fowler (Blackie's Library Epoch Series). Froude: Short Studies on Great Subjects Longmans Class Books of English Literature. Non detailed study: Scott: Quintin Durward, William Morris: Sigurd the Volsung—Longmans Class Books of English Literature. Church: Henry V. English Men of Action, W. W. Sutcliffe: The Past at Our Doors.

Sanskrit.—(When Sanskrit is the only optional language chosen by the candidate and when it is one of the two optional languages chosen by the candidate.) Uchchvasas I & II (Sri Vani Vilas Ed Sirangam.) Malavikagnimitra. Kiratarjuniya, cantos 1 and 2. Vemabhapalacharitam, Laghupaniniyam by A. R. Rajaraja Varma Kailash Tampuran, M.A., Trivandrum. Select portions: Pari-nishtakanda: Tignanta Prakriya, up to the end of Bhvadi, pages 135 to 160, Kritprakaranam (pages 270 to 303) Vibhaktiyarthaprakaranam (pages 313 to 336).

Greek.—Euripides: Iphigenia in Aulis (omitting the choruses) Herodotus: VII.

Latin.—Cicero: Pro Archia Poeta. Sallust: De Conjuratone Catilinae, Chapters 20 to the end. Horace: Odes, II, omitting 4, 5, 8, 11, and 12. Virgil: Æneid, IX.

French.—*Servitude et Grandeur Militaires* (Clarendon Press), Corneille: *Cinna*, Molière *Les Femmes Savantes*.

Arabic.—*Akh-wan-us-Safa*, from the beginning to the end of Chapter headed 'Khutbut-Zursur-wa-Hikmatuh.

Persian.—*Akhlaq-i-Mohsini*, Sikandar Namah-i-Barri, from the Chapter *Ayin-i-Shaktan-i-Hakiman* to the Chapter *Nashistan-i-Sikandar bar-takht* inclusive. *Yusuf Shah* by Mirza Jafar.

Physics and Chemistry.—Text-books recommended by the Board of Studies in Physical Science—(b) **Physics**: Rintoul, D.: *Introduction to Practical Physics* (Macmillan) Watson, W.: *Elementary Practical Physics* (Longmans) Schuster and Lees: *Intermediate Course of Practical Physics* (Macmillan). Glazebrook: *Hydrostatics, Light and Heat* (Cambridge University Press). Hadley: *Magnetism and Electricity for Beginners* (c) **Chemistry**: Smith and Hale: *Laboratory Outline of General Chemistry* (Bell) Adie: *Introduction to the Study of Carbon Compounds* (Clive). Reference:—Smith: *Introduction to General Inorganic Chemistry* (Bell).

Logic.—As a further indication of the scope and standard of the Intermediate Examination, Creighton's *'Introductory Logic'* Parts I and II, is recommended as a suitable text-book

History.—The attention of teachers and students is invited to the following books:—Bury: *History of Greece* (unabridged). Greenidge: *Handbook of Greek Constitutional History*. Shuckburgh: *The Story of Greece*. Mahaffy: *Alexander's Empire*. Fowler: *The City State of the Greeks and the Romans*. How and Leigh: *History of Rome*. Shuckburgh: *Life of Augustus*. Taylor: *Constitutional and Political History of Rome*. Pelham: *Outlines of Roman History*. Myers: *History of Rome*. Heitland: *The Roman Republic* (3 Vols.). F. F. Abbott: *Roman Political Institutions*. Greenidge: *Roman Public Life*. Bury: *Student's Roman Empire*. Tout: *Advanced History of Great Britain*. Gardiner: *Student's History of England*. Warner: *Landmarks of English Industrial History*.

BOMBAY UNIVERSITY.

Mr. Amritlal Bhimji Kothari, resident of Rajkot has offered to Government of Bombay on behalf of himself and his brother Mr. Manilal Bhimji, a sum of Rs. 25,000 to found two scholarships in the name of their father the late Rao Bahadur Bhimji Morarji. One scholarship of Rs. 350 per annum tenable for three years will be awarded to a student of the Dasha Shrimali Bania community (preferably a *bona fide* native of Kathiawar) studying in the College of Engineering at Poona for the B. E. Degree. The second scholarship of Rs. 450 per annum is to be awarded to a student of the same community studying in the Grant Medical College at Bombay for the degrees of M. B., B. S. and is tenable for five years.

PUNJAB UNIVERSITY.

MASTER OF ARTS: English (class II—1, III—3), Sanskrit (III—2) Arabic (III—1), Mathematics (II—1, III—1), History (I—1, II—3), Philosophy (III—1), Chemistry (II—1).

BACHELOR OF ARTS: First Divn.—II, II—63, III—72+2.
B. L. II—1, II—2,
M. Sc.—Physics (II—1 and III—1) Chem III—2, Zoology II—1, *Old Chemistry* (I—1).
B. Sc.—I—1, II—11, III—2.
M. B.—3.
B. L.—I—28+3, II=65+3+6.

Read the Medical Faculty Proceedings of 21st November, 1911. The opinion of the Medical Faculty that in view of the fact that the granting of a diploma or certificate to the Sub-Assistant Surgeon class is at present being considered by Government, any additional qualification is quite unnecessary, was recorded.

The payment of Rs. 124 to Pandit Pershad for work done in connection with the last Shastri Examination was ordered.

A memorandum from Mr. A. C. Woolner on the whole question of University Examinations was laid before the Syndicate. It was resolved that the note be circulated to members of the Syndicate, and to Principals of Colleges affiliated to the Punjab University, and that Principals of Colleges be invited to offer opinions on the proposals formulated by Mr. Woolner.

ALLAHABAD UNIVERSITY.

The Intermediate and the Matriculation examinations of 1912, will be held on Tuesday, the 19th March, 1912, and following days, beginning at 10 A.M. each day, one paper as far as possible being given daily in the Intermediate examination and two papers daily in the Matriculation examination. The L.L. M. examination of 1912 will be held on Monday, the 29th April, 1912 and following days, beginning at 7 A.M. each day, and one paper as far as possible being given daily.

REGULATIONS IN MEDICINE:—

(Continued from Page 239)

II.—FIRST EXAMINATION FOR THE DEGREE OF BACHELOR OF MEDICINE, AND BACHELOR OF SURGERY.

9. This examination shall be open to—(i) all students who have passed the Preliminary Scientific Examination for the degree of Bachelor of Medicine and Bachelor of Surgery of this University; (ii) all students who have passed the examination for the degree

of Bachelor of Science of this University, with Chemistry, Physics and Biology; (iii) all students who, under regulation 10 of this chapter, are entitled to sit for this examination, and who since passing any of the above examinations have completed a regular course of study—theoretical and practical—for the two academical years immediately preceding this examination, in a College affiliated to the University in Medicine; (iv) any person to whom the Senate by special grace, under section 19 of the Indian Universities Act of 1904, has granted permission to appear; provided that no person shall be permitted to sit for this examination more than three times in all.

10. Any student who has passed (i) the Intermediate Examination of the Punjab University taking Biology as an elective subject and the additional test in Chemistry prescribed under Regulation 12 of the Intermediate Examination of the Science Faculty of the Punjab University; (ii) an equivalent examination of the Universities of Calcutta, Madras or Bombay; (iii) the examination for the degree of Bachelor of Science in Chemistry, Physics and Biology of the Universities of Calcutta, Madras, Bombay or the Punjab; may be admitted to this examination, provided he satisfied the Registrar by a declaration that his parents either are residents of or have migrated or have been transferred at least two years before the date of the examination, to a place within the territorial jurisdiction of this University.

11. At this examination every candidate shall be examined in—(i) Anatomy, (ii) Physiology, (iii) Materia Medica and Pharmacy.

III.—THE FINAL EXAMINATION FOR THE DEGREE OF BACHELOR OF MEDICINE AND BACHELOR OF SURGERY.

12. The subjects of this examination shall be divided into two groups, and every candidate shall be examined in—Group A.—Midwifery and Gynecology Hygiene, Medical Jurisprudence. Group B.—Medicine, Surgery, Pathology.

13. This examination shall be open in Group A to all students who have completed, in a College affiliated to the University in Medicine, a regular course of study—theoretical and practical—for not less than two, and in Group B, for not less than three academical years, after passing the first examination for the degree of Bachelor of Medicine and Bachelor of Surgery. A candidate who fails in not more than two subjects in Group A or in Pathology in Group B may, at the discretion of the Board of Examiners, be re-examined in the subject or subjects in which he has failed, within six months from the date of failure.

A candidate who fails in the whole of Group A, or in any subject in Group B, except Pathology, shall be required to present himself for re-examination in the group or groups in which he has failed, after completing a further course of regular study for not less than one academical year in a College affiliated to the University in Medicine.

14. In the case of candidates who have passed with honours in any subjects, that fact shall be mentioned in the certificate or diploma.

15. These Regulations shall come into force with effect from 1st October, 1911.

AMENDMENTS TO EXISTING REGULATIONS.

That in Chapter XII, Regulation 5, the following be added:—

	Rs.
Preliminary Scientific Examination for the degree of Bachelor of Medicine and Bachelor of Surgery	10
First Examination for ditto	30
Final Examination for ditto	50

That the following words be added to Regulation 13 of Chapter XII:—

This regulation shall not apply to the examinations in Medicine in 1912, 1913, 1914.

In regulation 3 of Chapter XXVII to add the following:—

For the degree of Bachelor of Medicine and Bachelor of Surgery—a black stuff gown of the same shape as that worn by Bachelors of Arts of the University of Oxford. The hood shall be black silk lined with emerald green silk.

The proposal was seconded by the Hon'ble Pandit Sundar Lal, and *carried*.

GOVERNMENT NOTIFICATIONS AND ORDERS.

BENGAL AND BURMA

The following press *communiqué* is issued in the Education Department: The Secretary of state has appointed Mr. A. C. J. Baldwin, B. A., of the Oxford University, to the Indian Educational Service as Principal of the Government High and Normal Schools Rangoon.

The Director of public Instruction, Bengal will be glad to entertain applications for the award in 1912 of one scholarship of £200 per annum tenable at a European University to a member of the domiciled European and Eurasian community in India.

BOMBAY AND THE NATIVE STATES.

The Bombay Provincial Advisory Committee has been formed by Government for the purpose of giving to Indian Students going to England to study at the University for the liberal and technical professions, advice and information as to the conditions of admission, cost of living and education, courses of study, &c. The Office of the Secretary of the Committee is at 75, Hornby

State
Scholarships
for domiciled
Europeans

Bombay
Provincial
advisory
Committee

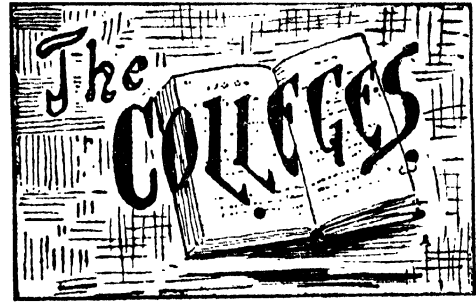
Road, Fort, Bombay. Parents or students are requested to apply for every kind of information as to the institutions to the Secretary and not to the Educational Adviser in London.

The following candidates (arranged in order of merit) have passed the European High School Scholarship and Certificate Exams : Class I. Ulric John Gilder* (John Conon High School Bombay), Enid Kathlun Cummings (St. Mary's High School Bombay)

Lowis Oswald* (Do.), David Solomn Perry (Bishop's high School Poona). Class II. Lena Bella Gayer (Girls' High School Punchgani), Kenneth Muller (Grammar School Karachi), George Maurice Macklre (Scottish Orphanage, Mahim Bombay), Marjori Rachel Grenhugh (Cathedral Girls High School Bombay), Anthony Robert Faleasde Carvatho (St. Mary's high School Mazagan Bombay), Marie Erna Strip (Grammar School Karachi), Manuel Norobha (St. Mary's School Mazagaon), Archie Wadia (Do.), Albert Charles Baptista (Do.), John Lile (St. Peter's high School Bombay). Class III : Clifford Kembl : Borrett (Scottish high School, Byculla), Reynolds Athayde (St. Mary's Mazagaon) (*Got Scholarships)

UNITED PROVINCES, C. P. and CENTRAL INDIA.

In view of the Govt of India's Resolution, the D.P.I. gives notice that candidates desirous of applying for the State Scholarships tenable in Europe for the scientific study of Sanskrit and Arabic should send in their application to D. P. I. U. P. not later than 15th Feby. 1912.



AND SCHOOLS.

The annual prize-giving to the students of the Sanskrit College took place on Thursday afternoon the 24th instant under the presidency of Sir Harcourt Butler. Lady Butler gave away the prizes. There was a large and influential gathering which included Sir Gooroodas Banerjee, Sir James Meston, Mr. Justice Woodroffe, Mrs. Woodroffe, Maharaja of Nasipur, Maharaja of Dinaipur, Mr. Justice D. Chatterjee, Mr. Justice N. R. Chatterjee, Nawab Siraj-ul-Islam, Dr. D. Ross, Mr. B. Dey, Pandit Shib Nath Shastri, Babu Ganesh Chandra Chander, Babu Damodar Das Burman, and Rai Sarat Chandra Das Bahadur.

The proceedings commenced with the reading of the report by Dr. Mohamohopadhyaya Satish Chandra Vidyabhusana, Principal of the College.

The institution at present consists of three departments—College, School and Tol. The College is affiliated to the Calcutta University up to the B. A. standard. The University M. A. classes in Sanskrit are mostly taught by the professors of the College. The School consists of 10 classes of which the lower five are conducted on vernacular basis and the upper five on Anglo Sanskrit basis. The Tol Department maintains its unique character by teaching a large variety of subjects—larger, in fact, than what obtains in any other institution of the kind in India—and by sending forth from year to year a continuous succession of scholars to different parts of India to take up the noble task of furthering the spread of Sanskrit education.

Sir Harcourt Butler delivered the Presidential address after the distribution of the prizes in which he touched on the old system of teaching Sanskrit and the reforms that

were proposed by the conference held at Simla last year.

The annual distribution* of prizes to the meritorious students of the Diocesan Collegiate School at Lansdowne Road, was held at Ballygunge, on Thursday afternoon the 25th inst. Her Excellency Lady Hardinge very kindly distributing the prizes.

Prior to the distribution of prizes a procession was formed headed by the Lord Bishop of Calcutta, who blessed the school, after which it was declared open for the ensuing session. The Rev. Sister Superiress then read the annual report for 1911. An enjoyable programme of music was gone through by the pupils, including piano quartette, violin music, Sanskrit recitation, action song and piano solos. The proceeding closed with a vote of thanks to Her Excellency for so kindly distributing the prizes.

Professor Ramlal Kanjilal, M.A., has left the College for a more attractive professorship of Sanskrit in the Srinagar College, Kashmere. Professor Kanjilal was extremely popular amongst the students and the general public in Gauhati. His learned edition of the Manu Samhita, C. II. with Kullaka's Commentary, which was prepared here, will long remain a pleasant monument of his connection with this College. It may be remarked in passing that this is the only scholarly edition of a University Text-book in Sanskrit that has been published in Bengal since the time of the great Iswar Chandra Vidyasagar. No professor has yet been appointed to take Professor Kanjilal's place.

The King and Queen have presented to the Presidency College a pair of finely executed large photogravures representing Their Imperial Majesties and bearing Their Majesties' autographs. It is Their Majesties' desire* that the portraits should be hung in a conspicuous place in the College. The College authorities have telegraphed to the King-Emperor's Equerry at Bombay the

devotion and gratitude of the members of the College to Their Majesties.

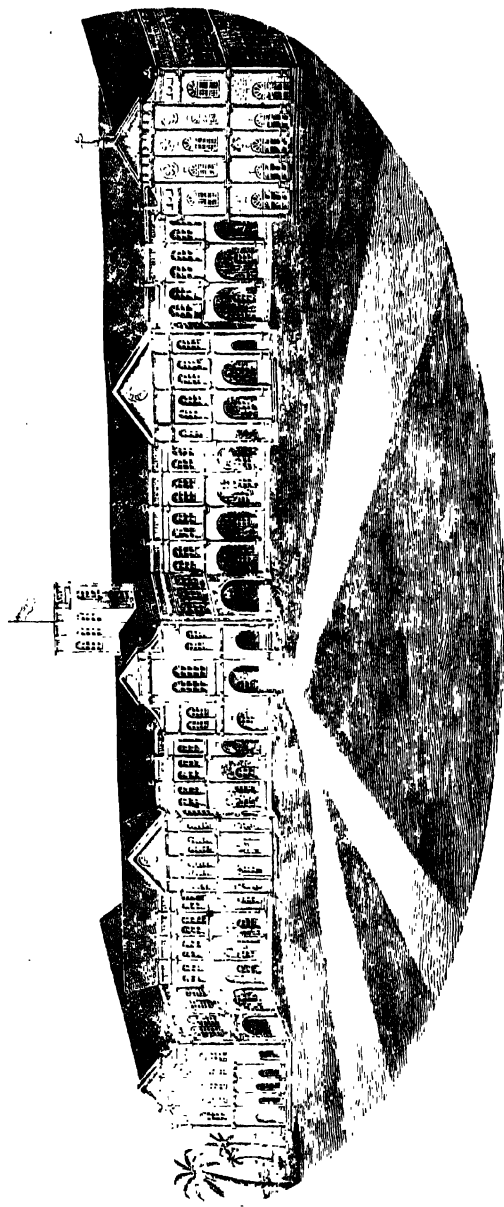
We are in receipt of the Report and prize List of the College for the year 1911.

The number of prizes awarded were many and varied and ranged through all grades of pupils. We note with pleasure the following items from the Rector's Report. The strength of the whole institution was steadily maintained, the total number of students being 1016, 1045, 1102 during the years 1909, 1910 and 1911 respectively. At present the institution numbers 140 in the College Dept., 256 in the High School Dep., 408 in the Lower secondary Dep. and 288 in the Primary Dep. The joint number of volumes in the various—Professors' and students'—Libraries is now over 10,756. The books added during 1910-11 were 468. We are glad to insert a photo of the institution by the courtesy of Fr. C. I. Ghezzi the Principal.

Mr. Yezdezard Dadabhai Elphinstone College Bombay Thanevala, Lecturer in Biology went on leave for 1 year from 5th January 1912. Mr. Shankar Purshottam Agharkar, is officiating.

This College founded some years ago by the Hindus of Delhi is dying an unnatural death for want of public support. Its B. A. classes were abolished two years ago for want of funds and the same threatens to be the case for the F. A. classes also unless funds are immediately forthcoming. Now that Delhi is the Capital of India it must be the duty of every Indian to lend a helping hand towards the maintenance of this institution and to see that it is once more brought to its former standard, if not higher.

A meeting was convened at Nagpur under the auspices of the Morris College Council, Nagpur, in connection with the portraits of Their Majesties with Their Majesties' autograph signatures, presented to the College. It was resolved amidst cheers to send a telegram expressing gratitude for the honour.



ST. ALOYSIUS COLLEGE, MANGALORE.
By the courtesy of Father C. I. GHEZZI, *Principal.*

The unveiling ceremony of the signed portraits of the King and the Queen presented to the Central Hindu College, Benares, by their Majesties, was performed on the afternoon of the 11th inst. by Mr. E. A. Moloney, Commissioner.

Mrs. Besant in a short speech remarked that the College owed much to the Emperor and the Empress and sent its grateful and loyal thanks, love and homage, to the great and truly Imperial personages, who in the midst of the splendour that surrounded them throughout their stay in India did not forget their visit to the Central Hindu College as Prince and Princes of Wales, and who as a sign of remembrance sent them their signed portraits which should be their most treasured presents.

A meeting was held on the 8th inst in the Strachey Hall of the Aligarh College, which were shown to the audience M. A. O. College amidst great acclamation their Majesties' portraits which have graciously been presented to the College with their Majesties' autograph signatures and thanks giving resolutions were passed.

Nawab Vicar-ul-Mulk has informed the trustees of the M.A.O. College that he has decided to retire from the Secretaryship of the College, the period of extension having expired on January 5th. The Mahomedan press makes an earnest appeal to the Nawab to continue in office till the time of the Charter of the Mahomedan University.

The opening ceremony of King George's Medical College and Hospital and Queen Mary's Hospital was performed here by Sir John Hewett. An address on behalf of the Committee was read by Sir Henry Richards Vice Chancellor of Allahabad University, who said it was desired that the College would be capable of giving a medical qualification which would be recognised universally.

The Lieutenant-Governor in the course of his address said that the demand for higher medical training had existed in these Provinces since 1860. In 1905, the visit of the King and Queen, then the Prince and

Princess of Wales, had inspired the idea of establishing a College to commemorate their visit. The College consists of the main building, an anatomical block, pathological and physiological blocks and medico-legal mortuary. The buildings have been designed in the Indo-Saracenic style and the total cost is about Rs. 30 lakhs of which Government of India contributed Rs. 10 lakhs. His Honour announced that the King had been graciously pleased to permit the college and hospital to be called after Their Majesties and had presented to the college two beautiful photographs of themselves.

His Honour then formally declared the College open.

The following affiliations are granted by the Allahabad University to the respective Colleges :—(1) ST JOHN'S COLLEGE Affiliations AGRA up to B. Sc. standard in Physics, Chemistry and Biology till the College moves to its new building. (2) REID CHRISTIAN COLLEGE LUCKNOW up to B. Sc. standard in Physics, Chemistry and Biology with effect from 1st July 1911. (3) TRAINING COLLEGE JUBBULPORE, for the Degree of Licentiate of Teaching from July 1911. (4) M. A. O. COLLEGE ALIGARH up to M. Sc. in Chemistry provisionally for two years from session 1912 and in Intermediate Biology from 1911. (5) ISABELLA THOBURN COLLEGE LUCKNOW up to Intermediate Biology from July 1911. (6) CANNING COLLEGE LUCKNOW up to B. Sc. Biology for two years with effect from 1st December 1911.



In the midst of his numerous engagements Lord Crewe found time to pay a visit to the Tata Iron and Steel Works at Kalimati. With him also went the Hon'ble Mr. Clark, the Hon'ble Mr. Enthoven, Sir James Meston, Sir Thomas Holland, the Hon'ble Mr.

Opening of
the Lucknow
Medical
College
Jan. 25. 1912

Tata-
Iron Works

Gokhale, Mr. Harold Cox, Sir R. N. Mukerji and others. The manufacture of steel has not yet begun, but the factory has now been turning out pig iron. At present two blast furnaces are at work and produce about 50 tons of pig a day. It is a pity that the Secretary of State was not also able to see the actual processes of the manufacture of steel, but he has satisfied himself that the processes are up to date. When the works are in full operation the manufacture of pig iron will cease altogether and the molten metal will be carried direct to great ladles to the steel house to be poured into a three-hundred-ton mixer and thence diverted into one or another of the open hearth steel furnaces to complete the cycle of manufacture. Lord Crewe spent fully an hour in inspecting the processes subsidiary to the action of iron and the work which will ultimately convert it into steel. The steel house is the largest building of its kind in Asia.

The annual Technological Examinations of the City and Guilds of London Institute will be held in Bengal at the Serampore Weaving Institute in April and May 1912. The exact dates will be announced later.

The Bengal Government has appointed a Committee to enquire into and advise Government on the whole question of the distribution of the subjects at present taught at Sibpur. It will be for the committee to consider in the first place, on the assumption that the present Civil Engineering College will be removed from Sibpur, what subjects at present taught at Sibpur will still have to be taught in Calcutta or, as has been proposed in connection with the Mining Department, in the locality where the connected industries are carried on. It will then be a matter for consideration whether it will be advisable to create a Technological Institute in Calcutta for the teaching of these subjects, or some of them, and if so, the following questions will require careful examination:—(1) the site of the institute; (2) the accommodation to be provided; (3) the staff required; (4) the extent to which existing institutions can be absorbed, and (5) the probable cost of the scheme.

Finally, in the event of provision being made for the teaching in Calcutta or its neighbourhood of a large number of the subjects at present dealt with in the Sibpur College, it will have to be considered whether it would be advisable for the two new provinces to make joint provision for the remainder of the instruction at present given in the College. If the Committee should come to the conclusion that such joint action would not be advisable, but that each province should make its own arrangements in the matter, it will have to be considered whether it will be necessary to create a Civil Engineering College for the new province of Bengal, or whether arrangements should not be made at institutions already existing in Bengal or elsewhere for meeting the requirements of the province in the matter of the teaching of pure engineering.

The following gentlemen are appointed members of a Committee to consider the above questions and to advise Government upon them:—

(1) The Hon'ble Messrs. F. A. Slack (President), E. W. Collin, J. G. Cumming, G. W. Kuchler, B. K. Finnimore; Mr. J. P. Wyness, nominated by the Chairman of the Calcutta Corporation; the Hon'ble Babu Deva Prasad Sarbadhakari; the Principal, Civil Engineering College, Sibpur; Mr. E. Hoogewerf, principal, Serampore Weaving Institute; Sir R. N. Mukherji, K. C. I. E., of Messrs Martin and Co., and Messrs. F. Larmour of Messrs. Lazarus and Co., G. H. Danby of the East Indian Railway Company; Mr. W. R. Steele, of Messrs. Burn and Co.; Mr. Krishna Chanda Dey of Messrs. Khetter Mohan Dey and Co. and the Superintendent of Industries and Inspector of Technical and Industrial Institutions (Secretary). The President is empowered to appoint such additional members as are in his opinion likely to assist the Committee in the consideration either of the general question or of any specific questions which may come before it. It is left to the President to fix the time and place for the assembly of the Committee which it is hoped, will be able to begin its labours at an early date.

Applications are invited for two State technical scholarships from candidates in the Bombay Presidency who are willing to undergo : (1) A course of study of architecture. The first scholarship is of the value of £150 a year and is tenable for two years in England. On good cause being shown the scholarship may be continued for a third year. Besides the stipend mentioned the scholar will receive a second class passage to England and a similar return passage to India if he has duly complied with the regulations under which he holds the scholarship.

The second scholarship is of the value of £300 in all, and is tenable for three years, two of which are to be spent in India, and the third in travelling in Europe. The selected scholar will be attached to the Consulting Architect to the Government of Bombay for two years during which period he must be prepared to undertake any course laid down for him at the Sir J. J. School of Art, Bombay. During this period he will be paid a stipend at the rate of Rs. 60 per mensem. During the third year the scholar will be required to carry out a tour for the purpose of Architectural study in Europe according to a programme which will be laid down for him by the Government of Bombay, and for this he will receive a stipend of £204. The scholar will also receive a second class passage to Europe and a similar return passage to India.

OTHER EDUCATIONAL ADVANCES.

A crowded meeting was held in the Town Hall on Wednesday evening the 17th January to further the Hindu University scheme. H. H. the Maharaja of Bikanir presided, and amongst those present were the Maharaja of Darbhanga, Mrs. Annie Besant, Sir Gooroo Das Banerjee, Pandit Madan Mohan Malaviya, Mr. G. Gokhale, Mr. R. N. Mudholkar, Mr. N. Subba Rao, Babu Bhupendra Nath Basu, Babu Sarada Charan Mitra, Mr. James Luke, Sir Vithaldas Thackersay, Mr. A. Chaudhuri and many others. The meeting was a most enthusiastic one, the crowded audience applauding

loudly the sentiments expressed by the various speakers. Amongst those present were a large proportion of Marwaris.

The Maharaja of Darbhanga proposed H. H. the Maharaja of Bikanir to the chair in a long speech.

The Maharaja of Bikanir in his opening speech explained the aims and objects of the University and said that religious teaching was essential.

Sir Gooroodas Banerjee in the course of his speech said that sectarian Universities filled the gap left by the other Universities and they were necessary for the imparting of that character, without which, as the King-Emperor has said, education was valueless.

Mrs. Annie Besant said the question on which she was to speak was one which the country had already decided, which the Government had practically approved.

'I am not so modest as the previous speakers,' Mr. Besant concluded, 'I want five crores at least. (Applause.) We don't want a second-rate thing that Europe will laugh at. We don't want a poverty-stricken staff and badly-equipped University. Princes may give lakhs but let lakhs of men give each one rupee and then the money will be here, and when we have one splendid University showing a model for the Universities of the future, then we will build others until India has many such buildings. But for the present, hand to hand, heart to heart, let us not only say 'God bless the University,' but let us make it and carry it out.

Pandit Madan Mohan Malaviya explained in Hindi the substance of what the previous speakers had said, and made a stirring appeal to the audience to subscribe to the funds of the University.

The Maharaja of Darbhanga then announced the following donations and subscriptions :— His Highness the Maharaja of Bikanir, an annual subscription of 12,000 rupees which being capitalised makes Rs. 3,36,000, and donation of one lakh making a total of Rs. 4,36,000.

The Maharani of Hathwa, one lakh, and promised that her son on coming to majority would supplement it by one or two lakhs.

The Mahant of Tarkeshwar, one lakh.

There were other donations also, the total coming to Rs. 8,06,000.



Sir William Ramsay has resigned the Chair of Chemistry at the University College, London.

The death is announced of Sir Henry Butlin President of the Royal College of Surgeons of England and Consulting Surgeon St. Bartholomew's Hospital. He was made a Baronet last year.

At a meeting of the Senate of the London University held on December 13th 1911, the Principal read a letter from the Chancellor, enclosing one to himself from which the following is an extract:—

"I have had before me for some time various schemes for the development of the University of London. Among these, I have been especially struck by the scheme for combining the two schools of Architecture at present separately conducted at University and King's Colleges. That scheme of combination seems to me thoroughly sound and as I am interested in promoting the study of Architecture, I wish to help it. The Senate have decided to place the new building for the School of Architecture on the north-west front of the University College site. I am anxious to do what I can to help in completing one of the most beautiful of London buildings. I therefore propose to erect the buildings for (a) the combined School of Architecture, together with the following—so far as a sum of £30,000 will suffice—viz: (b) Studios for the teaching of Sculpture, and the re-arrangement of the School of Fine Art, and (c) the Department of Applied Statistics including the Laboratory of Eugenics. Meantime I do not wish my name made known"

Four Students from Malda have come to America for education at Wisconsin State University. Their names are Rajendra Narayan Chaudhuri, Khagendra Narayan Mitra, Nabin Chandra Das, Baneswar Das. They will study chemistry, pharmacy, agriculture, and engineering respectively. They had their education in the Bengal National College and were working as teachers in different National Schools. The late Babu Radhes Chandra Seth and Babas Bipin Bihari Ghosh and Krishnalal Chaudhuri were the prime movers in sending them abroad. They will be under the supervision of the Association for the Advancement of the Scientific and Industrial Education of Indians. (*Modern Review, Jan., 1912.*)

The Cambridge Members' Prize for an English Essay has been awarded to Mr. Kshitish Chandra Sen, of Trinity Hall. The subject of the essay was "The Art of Biography." This Prize is given annually by Representative of the University in Parliament; its value is thirty guineas, and it is open to all students of the University who have not reached the M. A. or LL.M. degrees. It is a notable triumph for an Indian to win this coveted distinction. Mr. Sen was educated at the Hindu School and the Presidency College, Calcutta, and stood first in English honours in his B.A. examination. He obtained a Government scholarship for Cambridge, and is now reading for the Moral Science Tripos. In his essay he elaborated the idea that Biography is an art in the highest sense, not a mere chronicle of events; he emphasised specially two points. Sympathy as an instrument in biographical art, and the meaning and place of Personality in Life and Biography.

The following having passed the Examinations have been admitted Fellows of the Royal College of Surgeons: H. Ismail Janmahomed and S. Ariaratna Pillai Vairakiam. The following candidate has obtained the Licentiate in Dental Surgery; Jal Framji Patel.

London University.—*First Examination for Medical Degrees*; R. G. Dani, University College; S. Muttiah and N. M. Sen-Gupta, London Hospital.

Mr. Ajit K. Dutt has been admitted a Member of the Royal Society of Arts, and of the Incorporated Phonographic Society.

THE INDUCTIVE METHOD OF TEACHING.

A thorough change will have to be made in the art of education that obtains currency in this country in the interest of the comprehensive scheme of an altogether new method of teaching. To speak briefly the method to be inaugurated is such as enables the student to proceed from the known to the unknown according to the various stages of the development of his manhood, and confers on him the pleasure of actively exercising his own powers of observation and experiment at every step. The new method is calculated to enable the learner to enjoy the blessings of his intellectual gifts and constructive faculties as a human being, and realise his position as a discoverer and creator. This method will make him appreciate his own original ways of thinking and perceive the individuality of his intellectual life by introducing him not only to the truths to be learnt but simultaneously also to the methods and processes of discovering them. And it will arrange the subjects of study and topics for discussion in such an order of sequence and co-existence as is suited to the growth of the mental faculties and development of the powers of assimilation in man.

The scientist trudges through the *terra incognita* of his field of discovery by slow steps, and at every point he has got to struggle with many an obscure untruth that sometimes bewilders and defeats him. He can arrive at some sort of working hypothesis only after the collection of many seeming and partial truths as the result of his diverse investigations into the unknown. These hypotheses and half-truths, the products of the several stages of conflict between light and darkness, human effort and the resistance of Nature, constitute a long and tedious series which ultimately leads to the discovery of the final truths. The student has likewise to wade through the realm of knowledge with uncertain steps, encountering difficulties and overcoming them at every stage. He should follow the practice of the scientific discoverer and be prepared for a thousand and

one failures in acquiring mastery over a certain subject.

The duty of the teacher is not to force upon the students and make them memorise the truths that had been discovered by others, but to guide and assist them like a pioneer in their attempt to obtain knowledge at first hand and discover truths in their own way.

But there is certainly a difference between a scientific discoverer and a learner. The one has nobody to guide him, but has to grope absolutely in the dark and has necessarily to undergo many unnecessary and fruitless troubles. It is the silent and disinterested performance of such thankless tasks by many 'mute inglorious' workers that has prepared the way for a single discovery : and as a consequence a good deal of human energy has to be wasted for nothing. But the learner will be subjected to no such fruitless labour. There is for him the accumulated treasure of science and philosophy earned by the combined effort of different races and individuals, and there is his assistant, the teacher, who has in his possession the key of this treasury and is the master of its contents. The student need not discover over again the methods by which investigators have arrived at the truths, for they are all known to his guide, who is constantly watching his progress and helping him with suggestions in need. And so he can acquire easily and in a short time what was achieved by the world in many generations. There is little danger of a student's life being a total failure like the life of many a learned scholar and scientific explorer.

The pupil must not be a mere reader, he must be a discoverer and creator too. The young learner need not exactly follow the lines of research or blindly imitate the methods of investigation adopted by the writers and authors of books. The method of studying a subject is to be quite different from the method of writing a book. The books do not contain an account of the efforts and endeavours of the author, do not indicate the ways and means of investigation, and do not describe how a solution was arrived at. The authors try to put down, cut and dried, in an

ordered and systematic form their thoughts and ideas on a certain subject, the results of multifarious researches into it, and comparisons with the established truths and opinions about it. The attempt at systematising makes books consequential and logical indeed, but this art of book-making, while serving very well the purpose of books as books does not suit the requirements of the student; for to him the process of working out a problem is more important than the solution of the problem itself.

Even the books of learned authors are incapable of giving such help as the students require, and hence should not be used by them. Of course there are various reasons for which students should know thoroughly the contents of works by standard authors and their methods of presenting a subject and dealing with a topic. But the general rule of teaching should be not to introduce the pupil to any books except only such as are peculiarly calculated to suit the purpose of learners and specially made for their use, and not written as standard books embodying the products of any investigation. Books that compel the students to exercise their own faculties according to their capacity, books that are suggestive without being exhaustive are the only one that can be recommended to and may be studied by the students under the supervision of teachers. The study of a subject in accordance with the method of discovery necessarily involves freedom and originality of thinking, fosters the spirit of inquiry and develops the capacity for self exertion. Students brought up in this method will give unmistakable indication of free thinking, self-help, originality and inquisitiveness. This exercise of brain at one's own initiative quickens the intellect and rouses its powers, since exercise develops the faculties,—and the powers of the mind grow and develop when they have to grapple with difficulties. The student must not therefore stuff his memory with the second-hand knowledge derived from books written by others but should try to clear up the difficulties that he comes across while studying a particular subject.

Of the various methods of discovery *i.e.*, pro-

ceeding from the known to the unknown, the learner should use that which necessitates the investigation of a great variety of facts and phenomena the ultimate object being to systematise and methodise the results of these individual investigations and find out the unity in the diversity, the general principle underlying the varied instances. This method of inquiry by which one ascends from the individual to the general, particular to the common, concrete to the abstract, is called the inductive method. It affords a sound basis of facts for knowledge to strike its roots deep down. It compels the student to be an original thinker, who has his own responsibility to discover a path, by creating for him sufficient opportunities for making independent use of his own brain, and endows him with the scientific spirit of inquiry, the taste for seeking truths by habituating him to the analysis and synthesis of innumerable facts and events of the universe.

This method attaches special importance to the known facts, which are to be used as the basis, the data for discoveries and generalisation. Unknown facts must not be learned by rote from the teacher. There will be a predominance of object lessons and the study of facts and concrete things in a method like this. The student will have to acquire principles and general rules after the long and tedious analysis of individual cases. This method will demand of the student in the initial stages an intimacy with the materials and events that are close at hand and hence familiar, and subsequently with the growth of his intelligence and imagination the observation and study of distant, unfamiliar, and past or future facts and phenomena. Imagination based on reason will carry him gradually from the sphere of known facts to the region of unknown, and secrets of past and future will then be revealed to his eyes. By gradual steps the student will advance from simple to complex truths, and from the concrete facts to subtle and abstract generalisations or principles.

I.—Language.

In order to attain mastery over the languages we must adopt the same method by which we

learn our mother-tongue. In the first instance, the babbling child tries to express at least one simple idea. It is this expression of ideas to others and the development of his power of expression that give him gradually a command over the resources of his language and literature; and the necessity of expressing many intricate ideas according to the varied wants of life makes his expression manifold and complex.

One solitary word can scarcely express an idea. A complete sense, a full thought is represented by only the sentence. The sentence may be very short, it may consist of two words only, but it is the sentence that is the only vehicle of communication and interchange of ideas. The sentence must therefore be used as the unit of language; and the student must try from the very beginning to compose sentences in the language which he wants to learn. While practising to compose sentences he should learn how to avoid the errors and wrong uses as well as correct the mistakes committed by others. The learner should place himself in such situations in which he must try to express himself in that language and hold frequent conversations with those to whom that is the mother-tongue.

In short, any language to be learnt should be regarded as the mother-tongue.

Grammar as such may be dispensed with in acquiring a language and studying its literature. The rules of grammar are of course learned imperceptibly by students while composing sentences and actually using the language. But though grammar has to be learnt as an independent science, as preparatory to the study of philology and the logic of languages, no preliminary or concomitant training in the rules generalisations and definitions of grammar is necessary for learning the language itself.

II. History.

We have seen that the familiar method of picking up the mother-tongue by conversation and actual use of sentences to convey ideas is to be adopted in learning the other languages. So also the knowledge of the familiar contem-

porary national history to be used as the basis of all historical studies.

The knowledge of man about the universe grows and expands round self-knowledge, the knowledge about one's identity, continuity and individuality as the centre and nucleus of all truths. It is the perception of self that is the foundation of all other perceptions, that makes observation of and inferences about non-self possible. It is by placing the external *objects* in contact with the *subject i.e.* one's ownself, by comparing and contrasting the self with the non-self and realising the relations of one's own body and mind with the surrounding environment, both physical and human, that man acquires and develops his intelligence and thinking powers.

Hence the study and examination of the surrounding objects and events should follow and be grafted on intimacy and familiarity with the life and thought-processes of the individual self. A student of history must not therefore trouble himself with the account of remote ages and of foreign peoples at the outset. He should attend first to those factors of national life those familiar facts and phenomena of society in the making of which he himself lends his active help. The universe of thought and action which is actually bound up with the learner's own life and experiences which is being constantly modified and built up by the thoughts and activities of himself, and of those whom he knows most should be the object of the beginners' study and the 'radicle' of his further progress in history.

If a student has opportunity of placing himself amidst and observing the complex social, political, economic and religious movements of his own days, and of studying changes that are being effected therein, he can easily realise that every man by his thoughts and activities is a maker of his society's history and is shaping the destiny of his nation, and the conception dawns upon him that history is a living, growing and moving science and is the study of vital processes, and living and expanding thoughts and not of mechanical forces or dead substances. Such a study of concrete and living facts and

materials of national life will impress him with the similarity of life that exists between the ancient and the modern peoples and of those who are to come. This enables the reader to realise the fact that the actors on the stage of past or foreign history were men of real flesh and blood like those of the present epoch, that the industrial, political and social movements of the modern times have their prototype in the ancient world, that there is nothing extraordinary in the records of societies distant in time or space. History studied in this method makes a deep impression upon the mind of the learner.

The different stages of the evolution of human civilisation and the fundamental laws of progress as explained by the science of history are extremely subtle, and the comprehension of these scientific principles requires a vigorous exercise of the reasoning and imaginative faculty. To arrive at such a philosophy of history should be the aim and goal of historical study. But to a beginner these subtle and abstract truths seem to be rather unreal, imaginary and metaphysical. So it is the events and facts, incidents and movements out of which those subtle generalisations can be deduced, the data of the science of history and not the abstract principles and inferences that should form the basis of first historical lessons.

The learner must engage his attention to the concrete facts and institutions of civilisation and the factors of national life e. g., language, literature, philosophy, arts, industry, politics and religion of the people, and thus familiarise himself with the living forces that go to form the history of a country. He need not at the outset attend to the relations of cause and effect that subsist between the several constituents of national life or between it and the surrounding environments or to the laws of growth and development of the social organism as the unit of history. The student must first understand the forces underlying the events that surround him and make up his world of thought and action. He may then compare the present with the past and study it in the light of the present.

He will thus acquire a thorough knowledge of his national history, and this will enable him to institute a comparison between the characteristics of his own civilisation and those of other nations.

The student of history should thus ascend from the present to the past and through the national to the universal on the principle of comparing new acquisitions with the old and adding them to the existing stock. This method of study gives the student a sufficient grasp of the forces that go to form the life of a people. The student can in this way understand the position of his own country in the scale of nations and can effectively master the principles underlying the gradual evolution of civilisation and the law regulating the progress of humanity.

(To be continued)

B. K. SIRKAR.

SCIENCE AND PHILOSOPHY—II.

(Continued from Page 223)

Chapter IV.—Theory of Psychological Parallelism.

The theory of parallelism is worked out most consistently in the Philosophy of Spinoza who deduces it from the idea of substance.

Various forms of the theory Present physiologists and psychologists, such as Bain, Spencer Wundt, hold much the same view but they confine themselves strictly to experience, and explain only the relation of mind and organism by means of this theory avoiding all metaphysical questions. Spinoza makes his parallelism applicable universally; he holds that there is a mode of thought corresponding to each mode of matter, meaning thereby that when modes of matter become organised into living bodies, then modes of thought become organised into minds—our mind corresponding to organised living bodies. But the modern theory being wholly experimental is satisfied to show that corresponding to every mental process there is a process of the brain.

Materialism asserts that mind is a product of brain processes while parallelism holds that neither is the product of the other ; each set is distinct and irreducible to other ; it only asserts their concomitance without explaining why for this would involve metaphysical questions which it tries to keep clear. Hence modern experimental parallelism is incomplete owing to its avoidance of metaphysics.

Parallelism
and
Materialism

The parallelism hypothesis rises out of the question of the relation of mind and body brought to the forefront by Descartes in its dualistic form. Modern experimental theory which refuses to admit ultimate metaphysical questions is also a dualism though of phenomena—a series of mental states accompanied by a corresponding physical series entirely different in kind. The experimental theory assumes that only the physical processes of the brain and nervous system correspond to mental states and there is no sort of interaction between them as the older philosophers held for the two series are different in kind. The mental series is universal, Spinoza says, but the moderns however limit it to our own minds and those of animals. But from a psychological point of view there is a good deal of difficulty : we say that mental processes correspond to bodily which are known only in terms of sensations but what are these sensations if not mental ? In fact we do not know the nature of the two series we suppose to be parallel.

Dualism of
phenomena

The one is a series of molecular changes the other a series of feelings, ideas and volitions, and neither is reducible to the other.

Relation
between
physical and
mental series

But notwithstanding this disparity, Clifford thinks that each unit of idea correspond to a unit of matter just as a series of sounds correspond to the series of written letters, unit by unit, although the two are different in kind. But if this theory of Clifford be true, then there must be a unit of idea for every molecule, and if the elements be of 70 different kinds, as some suppose, the units of idea also must be so and if the elements are modes of one primary matter our different ideas

are also modification of one primal idea and so on—but this is evidently a “reductio-ad-absurdum” of the theory.

Clifford holds that corresponding to every atom of matter stuff there is atom of mind stuff attached to it, so that when the material atoms combine into organism, the corresponding units of mind stuff combine into mind and the mental units are not conscious by themselves but become so by their combination. But such existence of mind as isolated units is inconceivable. How can the combination of unconscious units of mind stuff give rise to consciousness ? How can a plurality of isolated units account for the unity of mind and how do the mind-stuff and the matter-stuff, different as they are, come to be united as the hypothesis assumes ?

Clifford's
theory

Clifford supposes atoms to have absolute reality whereas Spinoza considers it as well as mind to be but phenomena or aspects of one ultimate substance. Every change is a mental change from a subjective aspect and the same change is a material one when looked at from an objective aspect, from without. These changes, both mental and material are but different modes of the same unknown substance. This theory leads us to believe that our mental states correspond to physical states of the brain. But how can there be any correspondence between two heterogeneous things, and when material processes being manifestations of the same substance through our sensations resolve themselves into mental ones, what becomes of Spinoza's non-mental series ? It is either unknown something or nothing ; what we call the external world, is nothing but a hypothetical something. Erdmann thinks, however, that this is the theory as conceived by Spinoza—what is known to us is the mental series and the other series is merely inferred, but such idealistic interpretation of Spinoza has been objected to on the ground that his theory of two aspects which implies two series running parallel to each other and admitting of comparison, would then become meaningless. Again we cannot directly

Spinoza's
theory

compare the two series, for, simultaneously we cannot be conscious of our mental series as well as our brain series—at least two persons are required one to experience the mental states, and another to look to the brain processes, even supposing that the two series are parallel and capable of being compared, the question how they have come to correspond still remains to be answered. But the question does not arise here, because, Spinoza is sufficiently plain when he says that they are parallel manifestations of the same reality.

Defferent solutions of the problem have been suggested. One series reacts upon the other which then adjusts itself to it. But the two series being desperate and no causal connection being, therefore, possible between them, Descartes formulated the theory of occasional cause and Leibnitz that of pre-established Harmony. James says that it is absurd to think that there is an invariable connection between the two series utterly desperate as they are—they are separate as music and minerals and we do not know and never can know of any connection between them; we can know this much only that physical effects should proceed from physical causes and mental from mental.

Body and life are automatic mechanism going on by the interaction of physical forces inherent in them, and mind is a bye-product which springs accidentally from the working mechanism just as sound is produced by falling water, light by the grating of machinery and shadow by the hurrying train. The body is everything, is a mechanism complete in itself and mind is its effect having no power to affect it just as the shadow does not affect the train or sound the falling water, and thus it was the bodily mechanism that wrote the plays of Shakespear and mind though present as an epiphenomenon made no contribution to them. This is materialism pure and simple.

The conscious automaton theory gives the primacy to the physical series and though admits presence of mind as an epiphenomenon yet does

not admit any necessary connection between the two. Spencer and Huxley may be accused of contradiction, for, they advocate both parallelism and materialism; they say there are no causal connection between the two series and maintain at the same time that mind is a passive byproduct of matter! And, indeed, Spencer's metaphysical ideas are very confused. He says that matter is the producer of mind, and says at the same time that matter is known to us only in terms of our mental sensations and finally he holds that matter and mind are parallel manifestations of one unknown reality! According to automaton theory mind is impotent to control matter, it is an accompaniment but not a cause. But as materialism supposes mind to be a mere epiphenomenon having no power to control anything, it is inconsistent with the theory of biological evolution which assumes that mind has been an active factor in the development of living creatures. And, again though the bodily processes are purely mechanical yet the question how the body originated and how the different processes were set going still remains to be solved, for, as yet life has not been derived from inanimate matter. All attempts to account for living organism by derivation from inanimate matter have failed. The old maxim, *Omnivium ex ovo*, everything living comes from a germ i.e. from something living, still holds true. The physical organism, according to materialism, being thus a machine goes on automatically by forces inherent in it—forces which though lost in one form appear in another. But physical force cannot be changed except by another physical force and hence mind is outside the mechanical circle, materialism also implies that mind and brain working mechanically being the only reality. What we call mental activity must be an illusion, for mind is essentially an accidental byproduct having no power to affect any thing. What then about volition and what we call free will? Feeling of our own freedom is also illusory; it is the symbol in consciousness of changes taking place in the organism. We are conscious of activities and we think that the activities are ours and that we

The conscious
automaton
theory—
materialism,

Theory of
Inter action

The automaton
theory

ourselves make them because we are not conscious of the molecules of the brain and the chemical forces operating among them which are the real ground and cause of our activities. "If a stone falling though the air were conscious of itself", says Spinoza, "then it would think itself to be flying by its own free will".

Our conclusion is that mathematical Dynamics tells us how things behave in external nature—it says nothing as to why they do so, so that the theory leaves room for the assumption that behind the mechanical processes of nature there is a force which is not itself mechanical but mental, which is the producer of these processes. The mechanical is but the external aspect and not the whole of nature and it is a fallacy to abstract it and treat it as if it were the whole. The world may be a system of mechanical processes but its cause need not be necessarily mechanical. We may refer here to Descartes for the distinction between the formal cause and eminent cause of things—the seal which is affixed on a piece of wax is the formal cause and the mind which engraves the seal is the eminent cause of the shape of the wax. Mechanics tells us what the formal causes of things are, it tells us nothing about their eminent cause. Or we may say with Kant and Schopenhauer that physical forces operate upon and move one another along the circumference of a circle, but that which controls them, the force in the centre, is of an entirely different nature.

The fundamental assumptions of the theory of parallelism are that matter can be moved only by matter in motion and mind not by matter in motion cannot act upon matter of which therefore it is independent and that like can be produced and affected by like, hence neither matter nor mind can produce or act upon the other. But we are not warranted to make such assumption, they are groundless ; on the other hand, there is every reason to suppose that mechanical forces are determined by a mental force, for, in ourselves we find that our mind is able to control and direct our bodily movements which externally appear as

mental, and extending this idea to nature by analogy we can conceive it to be controlled from within by a force not mechanical but mental. This is, however, considered by Spencer and naturalistic thinkers as anthropomorphic. They however do not explain the origin of mind and think that it have come out of nothing. But individual minds have sprung out of nature in which, therefore, mind must be immanent.

Supposing then that man's thought cannot come out of nothing and there must already have been thought in the world out of which it sprang, we must draw these conclusions that physical events are determined ultimately by force not physical just as our bodily movements are determined by idea, desire and volition and that the amount of energy actually operative in the world need not, be always the same—it may be put forth and withdrawn again by the ultimate mental power so that the absolute amount of force in the world may be variable. The possibility of force being withdrawn and put forth again is admitted by physicists themselves in their theory of potential energy and the theory of conservation of energy needs the theory of potential energy to supplement it, though Ward says that potential energy is no energy at all and again all mechanics can be made to go backwards and start from the point where it originally was but the world process is irreversible,—and we must suppose that the ultimate source of energy must be mind.

(To be Continued.)

C. C. SINHA.

Mind the ultimate moving and directing power.

The consequences of the Idealistic Theory.

Theory of parallelism further criticised.

On a complete Investigation of a Phenomenon taking place beyond the Critical Angle

(Continued from Page 258)

[N. B. This Thesis was presented originally in French under the title of "Sur un phénomène se produisant en dehors de l'angle limite" to the *Société de Française de Physique de Paris* in June 1908 and the following extract was published in the *Journal de Physique* in its issue of February, 1909:—

SUR UN PHÉNOMÈNE QUE SE PRODUIT EN DEHORS DE L'ANGLE LIMITE;

PAR M. J. RAY

L'auteur ayant collaboré aux expériences faites par J. C. Bose sur la réflexion totale des ondes électriques a eu l'idée de rechercher s'il ne serait pas possible d'observer dans le cas des ondes lumineuses des phénomènes analogues à ceux qu'avait étudiés Bose.

Il remarque Newton, puis Fresnel, puis récemment Quincke, ont constaté que, dans certains cas, comme par exemple dans le cas de lames d'air comprises entre deux lamelles de verre, la lumière pouvait être transmise en dehors de l'angle limite.

Appliquant au problème le principe du "moindre temps," M. Ray a établi quelle doit être la forme de la surface d'ond, et trouve le chemin suivi par les rayons incidents, réfléchis et réfractés, en tenant compte des modifications apportées au trajet de la lumière par le voisinage de la surface de séparation des milieux différemment réfringents. Dans le phénomène de la réfraction totale, il faut tenir compte non seulement de la réflexion, mais encore des interférences; la loi de Descartes doit ainsi être remplacée par une loi plus compliquée que donne l'auteur. Toutes les particularités observées se trouvent parfaitement expliquées avec les hypothèses admises.

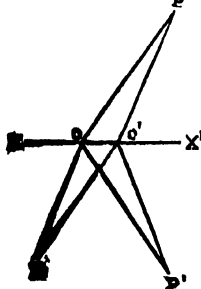
Extract du *Journal de Physique*, livraison de Février 1909.]

II

On the Modification of the path of a ray before and after it meets a surface.

Let XX' (Fig. 1) be the section of a surface separating two media of different refractive indices. Let P be a point on the path of the incident ray such that disturbances proceeding from P meet the surface XX' at two very near points O and O' from which as centres of disturbance proceed two new sets of disturbances one of which reaches P' another point in the same medium along the two consecutive paths POP' and $PO'P'$ simultaneously, while the other reaches P'' a point in the second or upper medium along the two

FIG. 1.



consecutive paths POP' and $PO'P'$ simultaneously. Then the difference between the times which the disturbances proceeding from P take to reach O and O' is the same as that between the times which the disturbances proceeding from O and O' take to reach P' and P'' severally. The above remark is also true for every other point on the path of the incident ray passing through P , as well as, for points on the paths of the reflected and refracted rays passing through P' and P'' respectively. It is to be remarked here that OO' must be smaller than the wave-lengths of the light for the two media.²

Let v and v' be the velocities of propagation of the light for the first and the second media respectively. Then the times which the disturbance starting from P takes to reach P' along the paths POP' and $PO'P'$ are

$$\frac{PO}{v} + \frac{PO'}{v} \text{ and } \frac{PO'}{v} + \frac{P'O'}{v'} \text{ respectively. Since}$$

these two times are equal, therefore

$$\frac{PO}{v} + \frac{PO'}{v} = \frac{PO'}{v} + \frac{P'O'}{v'}$$

$$\text{or } \frac{PO - P'O}{v} = \frac{P'O - P'O'}{v'} \quad (1)$$

Similarly, the times which the disturbance starting from P takes to reach P' along the paths POP' and $PO'P'$ are $\frac{PO}{v} + \frac{PO'}{v}$ and $\frac{PO'}{v} + \frac{P'O'}{v'}$ respectively. Since these two times are equal, therefore

$$\frac{PO}{v} + \frac{P'O}{v'} = \frac{PO'}{v} + \frac{P'O'}{v'}$$

$$\text{or } \frac{PO - P'O}{v} = \frac{P'O - P'O'}{v'} \quad (2)$$

Combining this with (1) we get

$$\frac{PO' - P'O}{v} = \frac{P'O - P'O'}{v} = \frac{P''O - P''O'}{v'} \quad (3)$$

Since the difference between the times which the disturbance originating at P takes to reach O and O' as well as, those between the times which the disturbances from O and O' take to reach P'

² A further and a fuller discussion on the subject will be taken up in a subsequent paper to be entitled "On the Study of Diffraction Bands produced by Refraction Gratings," wherein it will be shown that the case here may be considered as the limiting case of a class of phenomena to be treated therein. See also "Concluding Remarks."

and P'' severally, and represented by Equation (3), remains the same whatever be the positions of P , P' and P'' , we may regard the sides of Equation (3) as constant. Since ϑ is constant we may put down at once,

$$PO' - PO = P'O - P'O' = \frac{v'}{v''}(P''O - P''O') = k \dots (4)$$

where k is some constant the value of which will be determined presently.

It will be seen that the first part of Equation (4) refers to the path of the incident ray, the second part to that of the reflected ray, and the third part to that of the refracted ray.

The Incident Ray.

The equation for the path of the incident ray is, $PO' - PO = k$ which evidently denotes a hyperbola one of the branches of which represents the path of the incident ray while the other represents that of the reflected ray, as is also evident from the second part of Equation (4) which denotes the same hyperbola.

Its eccentricity is $\frac{d}{k}$, where d represents OO' , O and O' being the foci.

The transverse axis of the hyperbola is AA' which is equal to k and the conjugate axis = $\sqrt{k^2 - d^2}$ which is imaginary. Hence the incident and the reflected rays meet the surface XX' at A and A' (Fig. 2) respectively. Since the tangents to the curve at the points A and A' are perpendicular to XX' , the paths of the incident and the reflected rays are normal to the surface XX' at these points.

The directions of the asymptotes or tangents to the curve at points the distance of which from the surface is infinitely large in comparison with either d or k , that is to say, points situated at a finite distance from the surface XX' , are given by $\cot i = \pm \frac{\sqrt{d^2 - k^2}}{k}$ where i is the angle which the asymptotes make each with the normal to the

surface through the point C the centre of the hyperbola. The positive value refers to the asymptote to the branch representing the path of the incident ray, while the negative value refers to the asymptote to the other branch representing the path of the reflected ray.

Thus it follows that the paths of the incident, as well as, the reflected rays remain straight and coincide with the asymptotes upto a finite distance from the surface, and that within a very small distance of the surface they bend continuously towards that surface and ultimately meet it normally.

From $\cot i = \pm \frac{\sqrt{d^2 - k^2}}{k}$, we get $\sin i = \frac{k}{d}$ or

$$k = d \sin i \quad \dots \quad \dots \quad (5)$$

i being known as the angle of incidence.

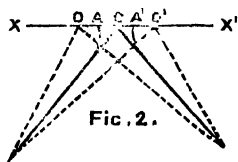
The Reflected Ray.

As regards the path of the reflected ray of which the equation is $P'O - P'O' = k$, we have already discussed the same in connection with the path of the incident ray.

It is also obvious that tangents to the hyperbola representing the two paths at points equidistant from the surface, are equally inclined to the normal to that surface. Hence it follows that the directions of the two paths at such points make equal angles with the normal. Thus the law of reflection becomes applicable for such points only. This remark applies for points situated within a very small distance of the surface. But for points situated at a finite distance from that surface, the directions of the paths coinciding with the asymptotes the law becomes applicable indiscriminately.

The Refracted Ray.

The third part of Equation (4) referring to the path of the refracted ray is, $\frac{v'}{v''}(P''O - P''O') = k$, where k , where k stands for $d \sin i$ (Eqn. 5) or $P''O - P''O' = k \frac{v''}{v'}$ and let this be $= k'$, where k' is some constant the value of which will be determined presently.



This is the equation of a conic of which O and O' are the foci and $\frac{d}{k}$, the eccentricity and represents either a hyperbola, ellipse or parabola according as d is greater, less than or equal to k' .

When v is greater than v' , that is, when refraction takes place from a less to a more refracting medium, k is greater than k' for $k = \frac{v'}{v} k'$ by assumption. Since d is greater than k , therefore d is also greater than k' .

Thus when refraction takes place from a less to a more refracting medium, the path of the refracted ray is one of the branches of a hyperbola. It meets the surface at A_1 (Fig. 3). Its transverse axis is k' and conjugate axis is $\sqrt{(k'^2 - d^2)}$ which latter is imaginary. The direction of its asymptote

$$\text{given by } \sin r = \frac{k'}{d}$$

where r is the angle which the asymptote makes with the normal through C , r being known as the angle of refraction. The asymptote meets the surface XX' at C .

Thus it appears that the ray emerges normally after refraction from the surface of separation at a point A'' the distance of which from C is $\frac{k'}{d}$ and then bends continuously away from the normal through C upto a very small distance from the surface comparable with d and ultimately coincides with the asymptote when the distance becomes finite, that is to say, infinitely large in comparison with d .

Since $\sin r = \frac{k'}{d}$ and $\sin i = \frac{k}{d}$ (Eqn. 5), therefore $\frac{\sin i}{\sin r} = \frac{k}{d} + \frac{k'}{d} = \frac{k}{k'} = \frac{v}{v'} = \mu \dots \dots (6)$

where μ is the index of refraction from the first to the second medium.

This is the ordinary law of refraction which holds good, therefore, for points situated at a finite

distance from the surface and ceases to become applicable for points very near that surface.

$$\text{Since } \frac{k}{k'} = \mu, \quad k = \frac{d \sin i}{\mu} \dots \dots (7)$$

When v' is greater than v , that is when refraction takes place from a more to a less refracting medium, k' is greater than k and d may therefore be either greater, less than or equal to k' . Hence arise three cases.

1. Case when $d > k'$.—When d becomes greater than k' , the path of the refracted ray is also a hyperbola. The ray emerges from the surface of separation normally at a point A_1 (Fig. 4) the distance of which from C is likewise

equal to $\frac{k'}{2}$. Its trans-

verse axis is k and conjugate axis is $\sqrt{(k^2 - d^2)}$ which latter is imaginary. The direction of the asymptote is given by $\sin r = \frac{k'}{d}$.

$$\frac{\sin i}{\sin r} = \frac{k}{d} + \frac{k'}{d} = \frac{k}{k'} = \frac{v}{v'} = \frac{1}{\mu} \dots \dots (8)$$

where μ is the index of refraction from the second to the first medium.

Thus here, too, the ordinary law of refraction holds good for points situated at a finite distance from the surface and ceases to become applicable for points very near that surface.

$$\text{Since } \frac{k}{k'} = \frac{1}{\mu}, \quad k' = \mu k = \mu d \sin i \quad (9)$$

2. Case when $d < k'$, that is, the case of Total Reflection.

When d is less than k' , that is when $\mu \sin i$ becomes greater than one, the conic is an ellipse, O and O' being its foci, $\frac{d}{k'}$ its eccentricity. Its major axis = k' and minor axis = $\sqrt{(k'^2 - d^2)}$ which latter is evidently real.

Thus the path of the refracted ray on emergence is normal to the surface XX' at a point A_0 the distance of which from C (Fig. 5) is $\frac{k'}{2}$. It be-

Fig. 3.

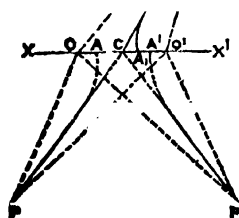
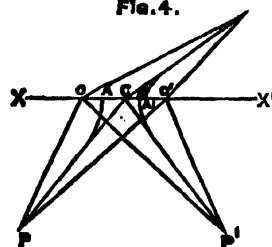


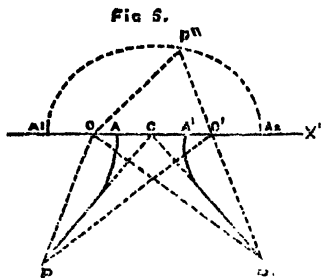
Fig. 4.



comes incident normally to the surface at another one. The interpretation of this is, that no disturbance passes beyond the line XX' into the second medium.

(To be continued)

J. RAY.



SYLLABUS OF MORAL PHYLOSOPHY—II.

(Continued from Page—261.)

point A_2 the distance of which from C is also $\frac{k'}{2}$,

and then gets refracted back into the first medium along the direction of the reflected ray and by interference with the latter constitute what is known as totally reflected light. The path, here, marks the limit up to which disturbances proceeding from O as centre of disturbance are propagated in the second medium. The limit to which they penetrate into that medium along a direction normal to the surface is given by

$$y' = \frac{1}{2} \sqrt{(k'^2 - d^2)} = \frac{d}{2} \sqrt{(\mu^2 \sin^2 i - 1)} \dots \dots (10)$$

which is the semi minor axis of the elliptic path.

Since the quantity $\frac{d}{2} \sqrt{(\mu^2 \sin^2 i - 1)}$ is of the same order of magnitude as d , the elliptic path of the refracted ray or, in other words, the depth to which the disturbances penetrate into the second medium, falls within a very small distance of the surface. It is, therefore, obvious that in this case the ordinary law of refraction does not at all become applicable.

3. Case when $k' = d$.—When $k' = d$, that is, $\mu \sin i = 1$, the locus of P'' is a parabola. Its focus is O' and its vertex A_1 becomes coincident with O . Hence the parabola is reduced to a straight line coinciding with XX' , which means that the refracted ray on emergence from the surface of separation just grazes it. This is also evident from the Expression (10) i.e. $\frac{d}{2} \sqrt{(\mu^2 \sin^2 i - 1)}$ which becomes zero when $\frac{k'}{d}$ or $\mu \sin i$ becomes equal to

Ethics as concerned with the idea of right involves then ethical problems of right duty and good. What is the nature of the distinction between right and wrong?

The scope of Ethics

What is the nature of the faculty which draws this distinction? What are the lists of rightness? The problem of duty involves the questions: What is the nature of deligation? To whom is it due? The problem of good involves the question: What is the end of human life—is it happiness or perfection or what? Ethics as concerned with the idea of right also involves three psychological problems regarding the nature of the springs of action, of the moral sentiments and of desire and will; and lastly it involves three metaphysical problems: Is our will free? What is the relation of man to nature? What is the relation of man to God?

As Ethics enquires into the forms and attributes of conduct, it may be called a theoretical

Science; but as a matter of fact, it is psychology, which investigates the nature of conduct and Ethics is based upon it. But Ethics is a practical Science for, it determines the highest good and thereby lays down the concrete duties of life and formulates method by which the moral ideal is realised—it teaches us how to act so as to produce a definite result. It is a normative Science too as it lays down norms or standards according to which actions ought to be regulated.

nature of Ethical Science

Is Ethics a Science or Philosophy? Ethics is only a study and it is not a science, for, Science deals with facts whereas Ethics deals only with ideals and opinions; Science, by observation and experiment, establishes accurate results and exact conclusions but Ethics does not do so. Yet it is a Science in the sense that it takes for its data the ways of man's acting, which are no doubt facts, and from these data it tries to establish general laws and to deduce therefrom the concrete duties of life; but it must be admitted that if it is a science it is not an exact science—it is an inexact science like Biology and psychology. But Ethics is more than a Science, it is a philosophy, for man's duty and end which Ethics seeks to determine depends on his place in the world-system which philosophy considers.

We have seen above that there are some sciences *e.g.* psychology, politics, sociology and philosophy, with which Ethics is ultimately related and hence in order to understand the scope of Ethics clearly we must distinguish it from and show its relation to psychology which analyses and classifies the springs of action, shows the origin of knowledge and explains the nature of will; to philosophy, which deals with the theory of self, with the validity of knowledge, with the problem of the existence of God and of the immortality of the soul; to sociology which attempts to explain the relation of the individual to society; and to politics which deals with the relation of the individual to the state. All these problems, psychological, philosophical, sociological and political, are bound up, more or less with the ethical problems.

Ethics differs from psychology.—Ethics is normative and psychology is positive. Psychology studies the nature of the processes of desire, motive and volition, while Ethics goes beyond this and determines what they ought to be and how they should be regulated. Ethics is based upon psychology, for, ethical questions suppose understanding of psychological results. Ethics deals with the question of what is good and bad, right and wrong, in

voluntary action, but before it proceeds to deal with such question it must know what voluntary action is and it is psychology which investigates its nature. Ethics is sometimes regarded as a branch of psychology. This view is in accordance with certain form of Hedonism which overlooks the distinction between "is" and "ought to be". Ethics according to them is a 'Science of those laws by which under certain conditions a pleasant or useful type of character is produced.' Ethics understood in this way is sometimes known as Ethology. But it should be remembered that it is the business of Ethics to determine what is truly desirable, and the discussion of what is desired belongs to psychology. Psychology might show that all men desire pleasure and Ethics might prove that pleasure is never really desirable.

Man is a political animal; he cannot be indifferent to the form of government, to the tendency of the political laws, carrying judicial rewards and punishments which he is subject to. Ethics is closely related to politics—both of them are practical and regulative, both endeavour to settle how man should act. Ethics differs from politics as to their standard, for, the standard of politics is expediency and that of Ethics is rightness—one aims at public utility and another aims at determining the rightness or goodness of actions in themselves; Ethics differs from politics as to their scope, for, politics is objective and collective, while Ethics is subjective and individual—one deals with the external forms and products and the other with the internal desires and motives of action, one aims to regulate the collective actions of man and the action of individual so far as it affects the public welfare and the other considers cases which do not affect collective welfare at all, considers the ultimate sources of actions within the minds of the individual; Ethics differs from politics as to their rank and authority—Ethics is superior in rank and authority to politics, for political laws should be subject to moral laws; and lastly Ethics differs from politics as to the nature of their sanctions, for, political laws are enforced by threats

Ethics—a
Science or
Philosophy?

Ethics and
other studies
on Sciences

Ethics and
Politics

Ethics and
Psychology

of punishment whereas moral laws are obeyed voluntarily for their intrinsic value.

The ancients thought that the duties and the virtues of the state are only the magnified forms of the duties and virtues of the individuals and hence according to them politics is the concluding portion of ethics. But this view is impossible both politically and morally. It is not possible for a state to carry out and enforce every detail in private life, it can only secure the performance of outward acts and not the formation of inward character. Some hold that Ethics depends on politics, for according to them the duties of an individual must be formulated in accordance to the ideal state of society to which they are due. But this view is not tenable as the ideal perfect state of society cannot be determined. But does politics depend on Ethics? That branch of politics, which is concerned with the constitution of government has nothing to do with Ethics, but that branch of politics which deals with the functions of government has some connection with ethics, for, these functions may be deduced to a certain extent from Ethics; but it must be remembered that the power of government to enforce duties is restricted both politically and morally.

Ethics is closely related to society, for man is a social being; he lives and moves and has his being in society; his well-being has obvious reference to that of society.

Ethics and
Sociology.

But Ethics also differs from Sociology, for Sociology is objective and Ethics is subjective, one deals with customs, laws and institutions and the other with desires, motives and disposition. Politics, therefore deals with the collective products of minds, for customs, laws &c. are not individual products, and ethics deals with the source of mental products, with the workings of the individual mind, with the inner springs of action. Sociology being the science of social structure and development is theoretical while ethics is, as we have seen, practical. Sociology supplies the data for Ethics. Ethics examines the data supplied by sociology, not as mere facts, but tries to find out indications of the ideal of human life as evidenced from the history of human

institutions and thereby it seeks to determine how men should be related to society.

Ethical enquiry involves metaphysical questions. Our conduct is the outward manifestation of our inward nature of the mind and, hence, in order to understand the nature and qualities of conduct with which Ethics deals we must also know the nature of the mental principle itself; we must know what is mind? Is it an aggregate of phenomena or is it a substantial reality with an end and function of its own? What is the nature of the self? Is our activity self-determined or otherwise determined? Is our soul immortal? Is there any such thing as future life? What is the nature of God and what is His relation to man? In short, these metaphysical principles viz. the substantiality of soul, freedom of will, future life and the being of God are so closely related to ethics that they are regarded by some as the postulates of Ethics.

Morality means an effort to attain perfection by regulating action according to a rational standard; while religion means a belief in a supreme being on whom we depend and whom we love and worship. Theology is a doctrine as to the divine nature and operation. Theology is that part of the philosophy of religion which treats systematically of God, His nature, attributes and relations and the grounds and limits of our knowledge of Him; and ethics is the science of morality. Now what is the relation between Ethics and Theology? Is it religion that makes morality? The legal theory supposes that the will of God makes action right and wrong and hence morality. If this be the case then we must admit that theology gives rise to Ethics, for our knowledge of God and his relation to man gives us the knowledge of right and wrong and thereby enables us to regulate our conduct. But an action is good not because God wills it, but God wills it because it is good. Is it morality that makes religion. Kant represents religion as essentially a sanction for duty and Martineau holds that we intuitively feel that we are under an obligation to

Ethics and
Theology

do what is right and obligation implies a person to whom it is due, but it cannot be due to man individually or collectively, for, indeterminate duties are not due to individuals and even determinate duties are likely to be waived if they be not ultimately referred to God. All our duties, therefore, determinate and indeterminate, are ultimately due to God. Hence it is morality that makes religion. If so, then Ethics gives rise to theology, for it is our ethical faculty that gives us the idea of God and his relation to man. Some hold that religion and morality spring from distinct source of mind—the source of morality is aspiration towards perfection and that of religion is feeling of dependence and longing for self-preservation. If religion and morality have distinct sources, then Ethics and theology are independent at first, but later on with the development of human consciousness they come to be interdependent; for the essential unity and harmony of mind is inconsistent with such isolation and, therefore, as our moral consciousness develops we find that power and excellence have a common source in God.

Thus we see that though the Science of Ethics closely related to psychology, sociology, politics and philosophy yet it is different from them all and cannot be regarded as a branch of any of them and hence as it occupies a unique position, as its scope is unique, its method also must be unique. The true method of Ethics is in a certain sense philosophical, psychological, biological and historical. It is philosophical in the sense that to determine the highest good of man, his destiny and place in the world system as a whole must be considered, but it never aims, however, at a comprehensive study of the universe as a whole; it is psychological so far as ethical questions depend on psychological results, but it never aims at the discovery of positive laws, nor does it deal with the psychology of feeling and knowing; it is neither biological nor historical in the sense that it does not aim at the discovery of the origin of conduct or of the positive laws of human progress; it simply enquires into the value

of conduct and interprets human progress as moral in relation to the Moral Ideal.

The method of Ethics is mainly scientific, for, observation and inference are the only avenues of knowledge and all truths so far as they can be made subject of discourse must be accessible to these. The method of the Intuitionists as also of the Hedonist is the scientific or psychological method. The transcendentalists on the other hand would explain morality as determined by the relation of man to God and Nature. From an a priori knowledge of God and Nature, they deduce the moral relation and in doing so they depart from the common scientific method. It is inconceivable, however, how by a sort of summer-sault in the air we can rise to the region of those realities; it is only possible by a great stretch of the imagination, and the method becomes dogmatic and hardly trustworthy. Of course, imagination has its use—hypothesis is a necessary part of the Scientific method, and in the sphere of Ethics too, it ought to be given a proper place. But hypotheses are possible explanations of facts and need be justified by these facts.

Martineau classifies ethical systems into unpsychological and psychological—Ethics as not based on psychology and ethics as based upon some psychological theory of the mind. Unpsychological Ethics is either physical, when based on a physical theory of the universe, regarded as constituted solely of phenomena (Comte) or metaphysical when based on a metaphysical theory of the universe, when it is believed that phenomena are supported by certain underlying reality and ultimately by God who may be either transcendent as Plato supposes or immanent as Descartes, Malebranch, Spinoza, &c. hold. Psychological Ethics is again either Ideo-psychological which regards moral faculty as unique or Hetero-psychological which resolves moral phenomena into non-moral. Hetero psychological Ethics includes: Hedonist Ethics which resolves moral phenomena into phenomena of sensations right and wrong being regarded as equal the pleasant and the pain-

The method of Ethics is mainly scientific

The methods of Ethics

Classification of Ethical Theories

ful (Hobbes, Bentham Mill &c.); Dianœtic Ethics which resolves moral phenomena into phenomena of intellect, right and wrong being regarded as equal the true and the false (Cudworth, Price, Clarke &c.); and Æsthetic Ethics which resolves moral phenomena into phenomena of artistic taste, right and wrong being regarded as equal the beautiful and the ugly (Shaftesbury, Hutcheson &c.)

(To be continued.)

C. C. SINHA.

On a Method of verifying the Law of Inverse Squares in the case of Magnetic forces.

Draw the magnetic meridian on a table along its length. Place a small freely suspended magnet on it, say at its north end, and count its number of oscillations under the action of the earth's magnetic force in unit time, say, 5 minutes. Let n be the number, and if H be the earth's force, then, $H \propto n^2 \dots \dots \dots (1)$

Next bring a bar magnet of length l and place it on the magnetic meridian drawn on the table in end-on position, its northpole facing the suspended magnet and placed at $2l$ distance from it, the southpole consequently being placed at $3l$ distance, count the number of oscillations in unit time which we have chosen to be 5 minutes. Next keeping the south-pole of the magnet at the same distance turn it over so that the north pole is now placed at $4l$ distance from the suspended magnet and count the number of oscillations. Next keeping the northpole at $4l$ distance turn it over so that the south pole is now placed at $3l$ distance and count the number of oscillations of the suspended magnet. Repeat the process counting the number of oscillations each time until it becomes equal to that obtained under the earth's force alone,

Let $n_1, n_2, n_3, \dots, n_r$ be the number of oscillations for the 1st, 2nd, 3rd, ..., r th positions,

successively of the bar magnet. Let the symbols $F_{2l}^n, F_{3l}^n, F_{4l}^n, \dots, F_{(r+1)l}^n$ represent respectively the forces acting on the suspended magnet due to the north pole of the bar magnet placed successively at $2l, 4l, \dots, (r+1)l$ distances from the suspended magnet. Let the symbols $F_{3l}^s, F_{4l}^s, F_{5l}^s, \dots, F_{(r+1)l}^s$ respectively represent, likewise, the forces due to the south pole placed at $3l, 5l, 7l, \dots, (r+1)l$ distances from the suspended magnet.

Thus we have the following relations :—

$$\text{For the 1st position of the magnet, } H + F_{2l}^n - F_{3l}^s \propto n_1^2 \dots \dots (2)$$

$$\text{" " " " " " " } H - F_{3l}^s + F_{4l}^n \propto n_2^2 \dots \dots (3)$$

$$\text{For the 1st position of the magnet, } H + F_{4l}^n - F_{5l}^s \propto n_3^2 \dots \dots (4)$$

$$\text{" " " " " " " } H - F_{5l}^s + F_{6l}^n \propto n_4^2 \dots \dots (5)$$

... ..

$$\text{For the } r\text{th position of the magnet, } H - F_{(r+1)l}^s +$$

$$F_{(r+2)l}^n \propto n_r^2 \dots r \text{ being even } (r+1)$$

Subtracting (1) from (2), (4), (6), ..., (r); and (3), (5), (7), ..., ($r+1$) from (1) we get the following relations :—

$$F_{2l}^n - F_{3l}^s \propto n_1^2 - n^2$$

$$F_{3l}^s - F_{4l}^n \propto n^2 - n_2^2$$

$$F_{4l}^n - F_{5l}^s \propto n_3^2 - n^2$$

$$F_{5l}^s - F_{6l}^n \propto n^2 - n_4^2$$

... ..

$$F_{rl}^n - F_{(r+1)l}^s \propto n_{r-1}^2 - n^2$$

$$F_{(r+1)l}^s - F_{(r+2)l}^n \propto n^2 - n_r^2$$

Summing up the above, we get

$$F_{2l}^n - F_{(r+2)l}^n \propto n_1^2 - n_2^2 + n_3^2 - n_4^2 + \dots \dots + n_{r-1}^2 - n_r^2$$

Since $F_{(r+2)}^n$ is very small when r is large, the left hand side becomes practically equal to F_{2l}^n and so $F_{2l}^n \propto n_1^2 - n_2^2 + n_3^2 - n_4^2 + \dots$

$$+ n_{r-1}^2 - n_r^2.$$

Again summing up the above relations, leaving out successively the first two, next first four, next first six and so on, we get the following :—

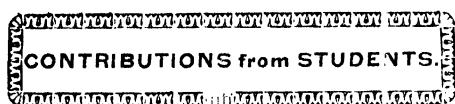
$$F_{4l}^n \propto n_3^2 - n_4^2 + \dots + n_{r-1}^2 - n_r^2$$

$$F_{6l}^n \propto n_5^2 - n_6^2 + \dots + n_{r-1}^2 - n_r^2$$

$$\dots \dots \dots \dots$$

The quantities F_{2l}^n , F_{4l}^n , F_{6l}^n ,... representing the forces which the northpole of magnet exerts on the suspended magnet from distances $2l$, $4l$, $6l$,... respectively from it. The advantage of this over the ordinary method is that by this the action due to one of the poles of a magnet, as well as, that of the earth's magnetic force is totally eliminated and so the effect of the other pole alone is obtained.

J. RAY.



HISTORY AS A SUBJECT FOR STUDY.

"All of us and every one of us ought to know how we have come to be what we are, so that each generation need not start again from the same point and toil over the same ground; but profiting by the experience of those who came before may advance towards higher points and nobler aims"—Max Muller.

Some are of opinion that History is a useless Study, extremely so, but for passing the university examinations! In every day life, in politics, in drawing inferences, in speculation and in enterprise they dislike to be guided by the past. They look

to their own faculties in such things—a right way indeed, had all men been so highly and equally energetic, capable, and quick brained. But their acts belie their contentions! Do they not really keep themselves to the left and right according to the directions on the finger-posts and their ships off the lighthouses in the vast ocean to escape dangers—eddies and sunken reefs? And what are these finger-posts and lighthouses but caution-records of the past, the History emblazoned in flume, of disasters met with? Individual initiative is often powerless to bring about great modifications and I believe there is scarcely an improvement which had not had its history. "History" says Mahammad Ali, "informs us that stones of ancient heroes operate as a warning to posterity," yet it is not merely the records of past events. As a man is not merely the collection of flesh and blood, nations will not merely be the sum of the individual wills, so history does not lie in the mere records of wars and kings, "The Essence of History" Says Macaulay "does not lie in laws, senate-houses or battle-fields but in the tide of thought and action—the world of existence that in gloom and brightness blossoms and fades apart from these Carlyle calls it "the Essence of innumerable biographies" although Buckle did not believe that History of mankind can be the history of Greatmen. The science of History may be defined then, as the Investigation and record of actual facts and occurrences, and the deduction from them of the general principles which govern and affect the life of nations—the minor of the past and the beam of the future.

I shall cite one instance of modern times to show the effect of History. Mr. G. A. Henty is a great author and a historian. He has culled the essence of History and put them forward before his Juvenile readers in a Series of about 80 books His works had such an influence on a South African boy that he could make himself a good hero and the winner of the "V. C." all through reading Mr. Henty's books which says he, "taught him to behave like a Man." In stimulating Moral Courage and in kindling enthusiasm for virtue History has Magical powers!

Disregard for teaching of History has everywhere been followed by serious effects and no where more than India. "The neglect of rational History" says Elphinstone "is one of the many causes of the absence of the more robust qualities of disposition and intellect throughout the mass of nation." True we have our Rana Prataps and Sirajis but the mass of Indian nation is more female than male.

(To be continued)

B. B. MAZUMDAR

William Shakespeare.

Immortal ! thou creator of Life and Death !
Divine spirit ! thou personifi'd ghost !
Instructor of the world ! whose sage commands
From England to distant regions obey'd,
Where art thou, faithful of Rowland de Boys ?
Belov'd son of earth ! Upon her laps thou art,
Sheltered by praises of human heart.
Mourned by the world's sorrow-heated breath.

Tarak Dass Banerjee

B.A. Student.



BOOKS.

General Physics. By Edwin Edser. (Macmillan). The long expected volume is out at last. This volume contains the first part of Physics, viz. General Properties of Matter, Hydrostatics, Gases etc. The author's volumes on Heat and Light have already become very popular with students and this volume was expected to treat the subject in a similar way, but we think the student would find this volume not exactly in a line with the two others, they would call it to be a little stiff. The book is well written.

A Course of Intermediate Physics. By Sailendra Nath Datta, M.A. (Chakraverty Chatterji and Co, 63, Harrison Road, Calcutta). Part I-Rs 1/8.

The first part of the book is only out. It treats on General Ideas, Heat and Magnetism. The book is best suited to the requirements of of Intermediate students of the Indian Universities. The treatment is simple though rather mathematical. A remarkable feature is the uniformity that has been kept throughout. The experimental portion is rather neglected although this has not in any way violated the author's

object. The beginner would be rather not drawn towards the book for this reason.

The Life and Work of Romesh Chandra Dutt, C. I. E. with an introduction by H. H. the Maharaja of Baroda. By Jnanendra Nath Gupta M. A., I. C. S. (London : J. M. Dent and Sons Ltd. 1911).

The author has succeeded in giving us a very lifelike portrait of the *three fold* energies or the distinguished man—the administrator, the man of letters and the political controversialist. The author has written with scrupulous fairness giving every reader of his book abundant materials for forming a judgement of his own as to the career, character and talents of one of the most gifted and conspicuous men of modern India.

A History of England for Schools, with Documents, Problems and Exercises. By N. W. Keatinge M. A. and N. L. Fraser, M. A. Two Vols. (London : A. and C. Black) Price 2s. 6d. each.

These volumes have been prepared on a new principle. The main facts of English history are first given in somewhat condensed paragraphs, furnished with neat and sufficient maps, then the genealogical tables; then come selected documents, in number, with "Problems and Exercises" in the form of 340 questions based on the documents. No attempts has been made to deal with literature. The new principle introduced consists in the presence of the documents and the provision of problems and exercises upon them which distinguish this school history from its predecessors.

A Primer of Teaching Practice. By J. A. Green and C. Birchenough. (London : Longmans) Price 2s 6d net.

Among pedagogical primers this book occupies a place which few could have occupied. The book supplies an obvious need and does so most efficiently. Among the newer and most valuable features of the book are the exercises which follow each chapter. Scattered through the book are many truths—not truisms which too often escape

PERIODICALS.

Humanity and Hindu Literature. Published by the Manager, Panini Office, Bahadurganj, Allahabad.

The objects of this newly started periodical are in its own words the following: "Our objects are wholly non-sectarian and non political. We publish only such pupers as are calculated to promote an interest in the study of Hindu Literature and Life, and prepare the way for Comparative Philosophy and Sociology."

The Aligarh Monthly. December 1911.

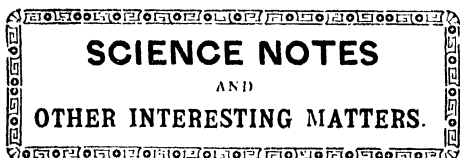
This special Durbar Number of the M. A. O. College Magazine is a bright one. Over and above the Frontispiece containing the portraits of Their Imperial Majesties it contains two more plates: (a) His Highness the late Nizam, (b) View of the M. A. O. College Aligarh, and a coronation calendar as a supplement. There are several interesting articles—the most noticeable ones being "The Arab conquest of Persia" by A. M. Naziruddin, "A house in the Plain" by D. Reynell, "The function a University" by C. S. Harper. These together with the report of the Mahomedan Educational conference and "Echoes of the Coronation" make the Magazine what it claims to be.

The Journal of Education. January Number.

The January Number of this established educational journal is before us. It is as ever replete with important educational topics and this first issue of the year is worthy of a premier Educational journal of the United Kingdom. The paper on "the relations of schools to the Universities" by Dr. James Gow and the article "Two schools in Nova Scotia—and a moral" by Constance Mayerstein are specially useful.

The Muslim Review. Nov. and Dec. 1911

The joint number of this magazine contains many articles worth reading; among these may be mentioned "Islam from a Puritanic Standpoint" by Prof. Samaddar, and "Alamgir—a Defence" by Mr. Mahmud Mahmud Usefiri.



A recent issue of the *Central Station Engineer* describes an "electric sign projector" which is exceedingly simple in its construction. Its essential features are a powerful little lamp, three lenses and a stencil containing the advertisement. The

lamp which is a 100 C.P. of the glower type, operates on the regular lighting circuit. The lenses the glower and the stencil are contained in a metal tube 14 in-long and 2 in-diameter. The tube is directed from the window of the shop towards the pavement and on the pavement the sign (consisting of the advt.) is projected which is very bright and easily attracts the attention of the pedestrian.

Experiments at the University of Wisconsin are regarded as proving that the generally prevailing theory that sulphur in the soil is of little value for promoting fertility is erroneous, and that sulphur is, in fact, of vast importance. Continuous cultivation, together with insufficient fertilisation, causes a large annual loss of sulphur, which cannot be compensated from the atmosphere and little is brought up by capillarity from the sub-soil. The experiments, therefore, recommend the application of fertilisers containing sulphur to lands which are frequently cropped. The failure hitherto to recognise the great value of sulphur in the soil is, says the *Philadelphia Record*, ascribed to faulty analytic methods employed by early investigators.

The mouth of a scientific millionaire may well water when he reads in the "Lancet" of a deposit of 76,050 tons of soot falling over the 177 square miles of the administrative area of London. For that soot contains 8000 tons of sulphate, 6,000 tons of ammonia, and 3,000 tons of chlorine, all of them valuable products in the chemical world. Ardour is damped, however, by the reflection that the total is no more than five ounces to the square yard, so that collection must prove a prohibitive business. What we want to do is to prevent the formation of the soot not to gather it after it has fallen. And the way to that is by reforming our methods of coal burning. The domestic stove is responsible for much waste, but the greater deposit in the City certainly suggests that the factory must take a larger share of the blame than it is usually willing to assume. And even when we have dealt with

Electric sign
Projector

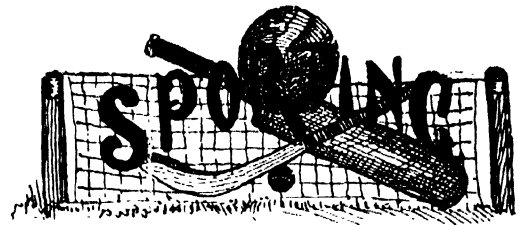
the solids of combustion we shall still have the more difficult problem of gathering the gases which are the main factors in destroying exposed metals and the stone-walls of our buildings.

When lantern slides are being shown to an audience numbering over a hundred, it is necessary to project the pictures on a large scale. Such large pictures are not merely unnecessary, but prejudicial in the case of classroom demonstrations. For large pictures, the room must be really dark, the lamp powerful, the lenses rather short in focus if the room is of ordinary size, the screen large and unwieldy. Such large pictures are unpleasantly coarse and the light is trying for those near the screen. It is far better to show a clear, well lit, well focussed picture of moderate size, with a dark margin of screen forming an effective background. Personally we like a picture of from six to seven feet diameter, and to use an objective of eight-inch, or preferably of ten-inch, focus. The number of slides exhibited in one lesson should not exceed twenty-five.

In England the theatre is vitiating the taste of the people by means of crazy melodramas and the fatuities of comic opera. The United States is a land of good suggestions. The New England *Journal of Education* describes a new movement, which has for its end the restoring of the drama to honour as an expression of the thought and heart of a nation. The American henceforth is to be educated by the play and to the play. There was founded last year at Chicago "The Drama League of America," which, far from attacking the stage as an institution, will train audiences capable of discriminating between good plays and bad, and will assist the good with patronage and recommendation. Already the League, only sixteen months after its foundation, has more than eighteen thousand members, drawn from twenty-nine different States. It works through two committees, the "educational" and the "playgoing." The "educational committee" seeks

to foster high intellectual and just emotional demands. It has issued six lists of plays for home reading; also four courses of study—on Significant Modern Dramas, Types of Drama, Racial Types of Drama, and Recent Successful Plays. Its junior department is organizing children's clubs to give dramatic performances, and indicating dramatic literature proper to be used in the various grades of school. Moreover, the educational committee will furnish a list of lecturers and teachers for schools, or a catalogue of dramas and reference books for public libraries. On the other hand, the "playgoing committee" forms an estimate of the chief plays as they are produced; if it approves the piece, a notice is sent round, outlining the plot and urging attendance. Complimentary tickets ("orders" we say) are never accepted; admission to the commended productions is obtained for students, teachers, and wage-earners at reduced rates. We are writing, be it observed, not of a scheme in the air: during the past year fifty-three plays have been attended by censors, and managers speak with pleasure about the support that has come of favourable notices. Let us take home the American example. The stage may be made an important factor in national education, and idea of reforming it through the school is not a mere chimera.

Education
through the
Drama



SPORTS.

Calcutta University Sports.

These Sports between the affiliated Colleges of Calcutta arranged to commemorate the visit of their Imperial Majesties to Calcutta, came off on the 4th January at Marcus Sq. There were many events, the chief winners being the Medical College, the St. Xavier's College and the Presidency College Students. The shield (for the

highest number of points) was won by the Medical College.

Hindu Hare School Sports. The annual fixtures came off on the 19th and 20th respectively. The school boys are to be congratulated on the excellent way by which they managed the events. In the Tug-of-War between the two schools the Hindu School boys came out victorious.

Inter-Collegiate Coronation Sports, Cannore.

The Inter Collegiate Coronation sports were held on the 21st December 1911. Medals and prizes were awarded to the successful competitors of the Christ Church College and the Agricultural College.

Inter-School Sports, Malabar.

The above sports were held on the 8th December 1911. The programme included eleven events. The following institutions competed.

1. The Zamorin's College, Calicut, 2. B. G. M. College, Calicut, 3. Native High School, Calicut, 4. St. Joseph's European Boys, High School, Calicut; 5. Victoria College, Palghat, 6. B. G. M. High School, Palghat, 7. Native High School Palghat, 9. Raja's High School, Kollengode, 10. Brennen College, Tellicherry, 12. Municipal High School, Cannore.

Roorkee Engineering College.

P. Raj Bahadur Hukku of the 3rd year class, Roorkee Engineering College, won the Maharaja of Vizianagram cup for being the best sportsman there.



A New Scheme of Works for Infants.

GEOGRAPHY.

(a) Social.

CLASS III. (Age 3-5.)

The Home : Its duties and interests ; those who minister to the needs of the home in the provision of food and clothing (not remote—e. g., the milkman).

CLASS II. (Age 5-6½.)

The Farm : More remote helpers in giving food and clothing. Trades and occupations of those who help to build the home and furnish it.

CLASS I. (Age 6-7½.)

Homes of other people :

(a) *Near at hand* : Comparison of typical people who live in the country with others whose homes are in the town.

(b) *Across the Sea* : Hut and tent dwellers—e.g., West Africans, Esquimaux, Arabs, Red Indians.

Dwellers in paper houses, e. g. Japanese ; in wood houses, e. g., a logging camp.

(c) *People across the Sea who minister to our Needs* : e.g. the Chinese (silk and tea), the Dutch (flowers, cheese), the Spanish (oranges, &c.), the American negro (cotton).

(b) Physical.

Daily records of the weather. Informal talks about the rain the wind, snow ice, thunder and sun shine, The colour of the spectrum.

Daily records of the weather and of the direction of the wind ; of sunrise and sunset and of the phases of the moon at certain seasons, i. e., of the moon in winter, of sunrise and sunset in autumn, spring, at midwinter and in midsummer. Length of shadow cast by the sun on a sunny summer day, in the morning, at noon, at 4 p.m. Colours of the rainbow.

Scenery of the district taught by walks : Highland, low land, level land.

Water : Springs, brooks, lakes, islands, rocks and soil.

Sunshine and shadow, the four cardinal points. Simple lessons on the four seasons.

The wind's direction, N., S., E., W., &c.

Observations and daily records as in Class II. Also of the North Star and the Great Bear. The rainbow.

Knowledge of local roads and where they lead. Direction and distance of places near to the school.

NATURE STUDY.

Animals and plants in the home—e.g., cat, dog, pet birds ; study of their habits and how to take care of them

Collection of leaves in autumn ; record of flowers in spring. Growing bulbs and seedlings. Simple study of animals and plants connected with the farm and its occupations—e. g., cow, horse, Records of bird life.

Collection of leaves in autumn ; records of appearance of flowers in spring ; order of trees budding and of leaf-fall. Fruits and seeds of common plants.

Natural history lessons on animals mentioned in stories and in geography lessons : e. g., squirrel, rabbit, camel, reindeer, silkworm, bear.

Hibernation ; migration.

Development of tadpoles and caterpillars.

Records of bird-life.

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BUSINESS NOTICES.

All communications intended for the Editor should be addressed "To the Editor" and not to any member of staff by name.

All communications of a business nature (advertisements, changes of address, enrolment as a subscriber) should be addressed to the Manager, and all remittances should be made payable to him.

NOTICE TO CORRESPONDENTS.

Correspondents are requested to write legibly on one side of the paper while sending in MSS. for the press.

Communications intended for publication must be accompanied by the name and address of the writer not necessarily for publication but only to satisfy the Editor.



Vol. 1 THE COLLEGIAN No. 9

An All-India Journal of Education.

CALCUTTA, THURSDAY 15TH FEBRUARY, 1912

We quote the following from the Press communique issued after His Excellency the Viceroy received a deputation of the Mahomedan gentlemen of Eastern Bengal on the 31st of January 1912.

"The Government of India are so much impressed with the necessity of promoting education in a province which has made so good progress during the past few years that they have decided to recommend to the Secretary of State the constitution of a University at Dacca and the appointment of a special officer for education in Eastern Bengal."

We are not in a position now to give any decided opinion about the proposed Dacca University. That will depend on the nature of the University that is going to be made there.

Whatever be the merits of the question, we simply say this that if the measure be taken up really with a view to promote the Educational progress of Eastern Bengal, that is, if the University be a really teaching University, certainly then it will be of some use to the cause of education. But as regards the appointment of a new educational Officer for Eastern Bengal we are afraid that would much curtail the power of the University, if as the Bengalee says "the Educational Officer is to be a sort of general supervisor of the University at Dacca."

* * *

The late Dr. Manekshah Gimi has left by his will, property, in valuable securities, the market value of which to-day amounts to rupees one lakh and ten thousand for establishing scholarships for Parsi students on the same lines as the Tata scholarships.

It is also understood that the Hon'ble Chowdhury Mahamad Ismail, Zamindar of Choramuddi in Barisal, has informed the Government of his intention to make a donation of his zemindary to the cause of Mahomedan education in Bengal. The gross income of the property is about rupees fifty-four thousand of which Rs. 12,000 is to be reserved for the donor for his life time and on his death his widow to get a pension and on her death the whole income will go to the fund. A committee under the control of the Local Government consisting of some leading Mohomedan gentlemen of the province will be vested with the trust of the property. It is further stated that out of the trust fund 28 Mahomedan students of Bengal will be sent every year for education in Europe.

* * *

The annual meeting of the Asiatic Society of Bengal was held on Wednesday the 7th inst. at No. 1, Park Street. Colonel G. F. A. Harris presided and there was a fair attendance of ladies and gentlemen, among those present being Sir Thomas Holland.

The President made a lengthy speech in the course of which he said that in the medical section some valuable papers had been read during the year on various professional subjects. After the opening of the new Physiological laboratories it became the custom for the medical staff of the Hospital to send different pathological fluids to the laboratory for complete analysis. The results obtained differed so widely from the standards that had been worked out for Europeans that it became an urgent matter to determine the nominal standards for the people of Bengal, in order that rational deductions might be drawn when a departure from that normal was found to occur. On proceeding to determine these standards for

the blood and other fluid secretions of the body, it at once became evident that the solid constituents of those fluids in the Bengali were very much less than those given in the accepted standards for Europeans. In round numbers the figures were from $\frac{1}{2}$ to $\frac{3}{4}$ of the European standards.

The Hon. Justice Sir A. T. Mukerjee then proposed a vote of thanks to the chair, which was carried unanimously.

Office bearers were elected for the current year and the proceedings terminated.

* * *

On Friday the 2nd of February, a meeting of the Calcutta Chemical Club was held, when Dr. P. C. Ray gave a short account of the "New series of alkyl ammonium nitrates" and the past year's work. Dr. Aghore Nath Chatterjee took the chair, and spoke very hopefully of the future of the young Indian Chemists that have been working under the inspiration of Dr. Ray. Among those present, the most prominent were Prof R. N. Sen of Sibpur, Prof J. Bhaduri, Mr C. Bhaduri, Mr S. C. Mukherjee, Mr Nilkanta Nandi, Mr Manindra Nath Banerjee of B. N. College, etc.



CALCUTTA UNIVERSITY

The Governor-General in Council is pleased to reappoint the Hon'ble Justice Sir Ashutosh Mukherji, Kt., C. S. I., M. A., D. L., D. SC., F. R. A. S., F. R. S. E., to be Vice-Chancellor of the University of Calcutta, with effect from the 31st March 1912.

Re-appointment
of Sir Ashutosh
Mukherji

Asiatic
Society
Annual
Meeting

Calcutta
Chemical
Club

The Intermediate, B, A and B. Sc. Examinations this year which were to commence on the 18th March have been arranged to begin one week later viz. from the 25th March 1912. The exact dates for each subject have not yet be settled.

Examinations
Dates

MADRAS UNIVERSITY

TEXT BOOKS FOR B. A. DEGREE

EXAMINATION 1914.

UNDER THE NEW REGULATIONS.

ENGLISH.

(A) Books set for Composition—Non detailed Study :

Dickens :—A Tale of Two Cities.

Jane Austen :—Pride and Prejudice.

Froude :—Oceanic.

Frederick Harrison :—Chatham in Twelve English Statesmen (Macmillan).

(B) Detailed Study :

(1) Shakespeare :—One of the following Groups—(a) Hamlet ; The Tempest. (b) King Lear ; As You Like It.

(2) Select Examples of 16th, 17th, 18th and 19th Century Verse : One of the followi ; Groups—(a) Milton ; Comus Pope : Epistle to Dr. Arcuthnot. Woreswortl Intimations of Immortality ; Laodamia. M Arnold : The Scholar Gypsy ; Thyrsis. (b) Spenser : Prothalamion. Dryden : Annus Mirabilis. Johnson : The Vanity of Human Wishes. Tennyson ; Maud,

(3) 16th, 17th and 18th Century Prose : One of the following Groups—(a) More : Utopia. Swift : The Battle of the Books. Gibbon : The Age of the Antonines Chap. II. Sunday : Apology for Poesy. Dryden : preface the Fables. Johnson : Lives of the Poets—Milton and Addison.

(4) 19th Century Prose : One of the following Groups—(a) Charles Lamb : Essays and Letters selected and edited by A. Guthkelch (George Bell and Sons). Landor ; Imaginary Conversations—Marcellus and Hannibal ; Metellus and Marius ; John of Gaunt and Joanna of Kent ; Leofric and Godiva ; Essex and Spenser ; Lord Bacon and Richard Hooker ; southey and Porson ; Lucullus and Cæsar ; Marcus Tullius and Quintus Cicero (The Camelot Series—Walter Scott). (b) Carlyle : Essay on Burns. M. Arnold : Discourses in America. Newman : Rise and Progress of Universities, Chapters I to V.

(5) The History of the Language—Chaucer : The Prologue to the Canterbury Tales.

NOTE.—The same text-books Prescribed above under (B) for Detailed Study in English have been prescribed for the examinations of 1915 and 1916.

GROUP II-A,

Text-Books recommended by the Board of Studies in Physical Science :—

Physics :

Porter : Intermediate Course in Mechanics (Murray).

Wagstaff : Properties of Matter (University Series).

Poynting and Thomson : Sound (Griffin).

Edser : Heat and Light (Macmillan).

Hadley : Electricity and Magnetism (Macmillan).

Glazebrook : Electricity and Magnetism (Cambridge University Press).

Schuster and Lees : Practical Physics (Cambridge University Press).

Glazebrook and Shaw : Practical Physics (Longmans).

Reference

Poynting and Thomson : Properties of Matter (Griffin).

Do. Heat (Griffin).

Watson : Practical Physics (Longmans).

Chemistry :—

Smith 'Introduction to General Inorganic Chemistry' (Bell).

Holleman : 'Inorganic Chemistry' (Wiley).

Arrhenius, tr. Price : 'Theories of Chemistry' (Longmans).

Senter : 'Outlines of Physical Chemistry' (Methuen).

Walker : 'Introduction to Physical Chemistry' (Macmillan). Omitting Chapters XII, XV, XVI, XVII, XXII, XXVI, XXVII, XXIX, XXX, XXXII, XXXIII, XXXIV, and XXXV. Ladenburg, tr. Dobbin : 'History of Chemistry I—VI (Simpkin).

Fenton : 'Notes on Qualitative Chemical Analysis,' (Cambridge University Press).

Bailey : 'Elements of Quantitative Analysis,' Chapters I—IV and VII—X (Macmillan).

Reference :

Roscoe, and Schorlemmer : 'Treatise on Chemistry,' Vols. I and II (Macmillan).

GROUP II-B.

The works in Chemistry recommended for Group II-A of the B.A. Degree Courses and, in addition, the following :—

Caven and Lander : 'Systematic Inorganic Chemistry' (Blackie).

Ostwald, tr. M'Gowan : 'Scientific Foundations of Analytical Chemistry' (Macmillan).

Perkin and Kipping ; 'Organic Chemistry' (Chambers)-

Beruthsen, tr. Sodborough : 'Organic Chemistry' (Blackie).

Thorpe ; 'Essays in Historical Chemistry' (Macmillan).

Treadwell and Hall : 'Quantitative Analysis' (Wiley).

Caven : 'Systematic Qualitative Analysis' (Blackie), as an alternative, if desired, to Fenton's 'Notes on Qualitative Analysis.'

Reference :

Alembic Club Reprints.

Treadwell and Hall : 'Qualitative Analysis' (Wiley).

GROUP IV. (Mental and Moral Science.)

Part II :

Text-books recommended :

(1) Mellone's 'Introductory Text-book of Logic' and Bosanquet's 'Essentials of Logic.'

(2) Angell's 'Psychology.'

(3) Mackenzie's 'Manual of Ethics.'

Philosophical work prescribed :

(4) Berkeley's 'Treatise concerning the Principles of Human Knowledge.'

GROUP V. (History)

5. Special subjects :—(a) English History, 1485—1603, to be studied with the original sources as furnished in Frazer : English History illustrated from original sources, 1485—1603 (A. & C. Black) (b) The Rise of the Portuguese Power in India (to about 1580).

GROUP VI.

Sanskrit.

Rupavata of Dharmakirti, Part I : Stripratyayavata, Karakavata and Samasavata, edited by Rao Bahadur M. Rangachariyar, M.A. Triplicane.

N. B.—Vaiyakaran discussions to be omitted.

Kavyalankarasutravritti by Vamana, omitting Prayogikadhikarana (Sri Vani Vilas Press Edition, Srirangam).

Kiratarjuniya—Cantos I to III.

Kadambari—Purvabhaga—from Katharambha to the end of Sukanasopadesa, Sakuntalam.

BOMBAY UNIVERSITY.

At a meeting of the Senate, Mr. K. Subramani Aiyer moved the following as recommended by the Syndicate—(1) That a new degree of Commerce be designated the Degree of Bachelor of Commerce be instituted in the faculty of arts and that the accompanying syllabus of studies for the Degree be approved and adopted. (2) That the Syndicate be requested to frame and submit to the Senate regulations regarding the Dates, fees and other details in connection with examinations for the said Degree.

SCHEME OF STUDIES FOR THE DEGREE OF BACHELOR OF COMMERCE.

1. Candidates for the Degree of Bachelor of Commerce (B. Com.) must have passed the Matriculation Examination, and will be required

to pass two subsequent Examinations, the first to be called the Intermediate Examination in Commerce, and the second the Examination for the Degree of Bachelor of Commerce.

FIRST YEAR.

2. Candidates will be permitted at the end of the first year to enter on a course for the Intermediate Examination in Commerce, provided that they produce a certificate from the Principal of an Arts College showing that they have satisfactorily carried out the work appointed for the first two terms in Arts, or a certificate of having passed the Previous Examination of this University.

INTERMEDIATE EXAMINATION IN COMMERCE.

3. No Undergraduate will be admitted to this Examination unless, after obtaining a certificate from the Principal of an Arts College showing that he has satisfactorily carried out the work appointed by the University for the first two terms in Arts, or else after passing the Previous Examination, he shall have kept two terms at a College or Institution recognized in Commerce, and unless he produces satisfactory testimonials under Form.

4. Candidates for the Intermediate Examination in Commerce will be examined in the following subjects :—

- I. English.
- II. Political Economy.
- III. Mercantile Law and Practice.
- IV. Accountancy.

I. ENGLISH—two Papers.

(a) English Texts (One Paper).

(b) English Composition (One Paper).

Additional marks will be assigned for good handwriting in each paper.

II. POLITICAL ECONOMY—One Paper.

Economic Schools of thought. The Factors of Production ; Labour, Nature and capital ; the Methods of Production. Organisation, Association, Division of Labour, the Circulation of Wealth, Exchange, Credit and International Trade. Distribution, Wages, Interest, Rent and Profits. Consumption, Spending and Saving.

Text-book recommended :—

Principles of Political Economy, by Charles Gide.

III. MERCANTILE LAW AND PRACTICE—two Papers.

Contracts : the leading features of the Indian Law of Contracts with special reference to Purchases and Sales, Agency and Partnership. The leading features of the Indian Company Law. Bills, Cheques, Notes and Letters of Credit ; General and Special lien ; Discounting Bills, Raising Loans and Collecting Interest and

Dividends ; Charter Parties and Bills of Lading ; Ocean, Canal, and Railway Freights ; Lay Days ; Demurrage ; Customs Regulations about loading and clearing goods ; Open and Valued Policies of Insurance ; General and Particular Average ; Total Loss , Average Clause ; Bottomly Bond.

Text-Books recommended :—

Pitman's Commercial Law, by J. A. Slater.

The leading provisions of the Indian Contract Act, the Indian Companies Act, the Indian Negotiable Instruments Act.

Modern Business Training, by J. K. Grebby.

Marine Insurance, by Frederick Templeman.

IV. ACCOUNTANCY—One Paper.

Keeping the subsidiary books, posting in the Ledger, preparing Trading and Profit and Loss Accounts and Balance Sheets of General Merchants, Partnerships, and Joint Stock Companies. Bad Debts, Depreciation and Reserves.

Text-Books recommended :—

Book keeping and Accounts, by L. C. Cropper.

Student's Book-keeping, by Arthur Fieldhouse.

Principles and Practice of Book-keeping, by K. Subramani Aiyar.

dered suitable for distribution in this way, and of annual reports issued by Government ;

(b) free supply of press notes in English and the appropriate vernacular ; and

(c) free supply of Part 1 of the *Bombay Government Gazette*.

(iv) No Government servant shall join, or remain a member of, any library which has not been registered.

(v) No grants from State funds shall be paid to libraries which have not been registered ; and the attention of each municipality and local board concerned should be drawn to the impropriety of according any support, financial or other, to such libraries ;

(vi) These instructions apply only to libraries which take in vernacular newspapers and literature.

Two lists are appended—

List A—registered libraries which have agreed to abide by the rules of the 14th October 1909 ;

List B—libraries already registered which refuse to abide by these rules. The libraries in list B should now be struck off the register, and any Government servant who is a member of any of them should forthwith resign his membership.

GOVERNMENT NOTIFICATIONS AND ORDERS.

BOMBAY AND THE NATIVE STATES.

The following Press Note has been issued.—

The Governor-in-Council has had under consideration the question of the registration of

vernacular libraries and the official

support that may suitably be accorded

to such libraries when registered. He

is pleased to issue the following general instructions in the matter.—

(i) The register of approved libraries will continue to be kept by the Director of Public Instruction who is given full discretion to grant or refuse registration ; a 'registered' library means a library entered in the Director of Public Instruction's register.

(ii) No library will be registered the management of which does not agree to conduct it in accordance with the rules promulgated in Government Resolution No. 2037, dated the 14th October, 1909.

(iii) On registration a library will be accorded the following official support—

(a) free supply of departmental publications, of books purchased by Government which are consi-



and Schools.

Sir George Clarke performed two interesting functions on the evening of the 7th inst., the

inauguration of Runchodlal Madhowlal

College of Science and Chimanlal

Nagindass Hostel for the students of

the Gujrat College. Representatives

of all classes were present. Many

ladies of Indian and European communities were also present. The College of Science was the

gift of Sir Chinubhai Madhavlal who placed at the disposal of the Bombay Government four

lakhs to start a science institute on condition that the Government undertake the management of the

Inauguration
of the
Runchodlal
Madhowlal
College of
Science
Ahmedabad

Institute. The funds now amount with interest to more than 6½ lakhs. Government have contributed one lakh and a half undertaking to build a home for the professor of Chemistry and Physics. The hostel was the generous gift of Amballal Sarabhai in memory of his uncle Chimanlal Nagindas. Sarabhai gave Rs. 31,000 to Government on condition that it would undertake management of the hostel.

In the course of his speech Sir George Clarke thanked Sir Chinubhai for the generous munificence and paid tribute to the wealthy class of Indians who gave freely towards advancement of learning. His Excellency said, "Sir Chinubhai agrees with me that the application of sound and sane Swadeshi principles is essential to the progress of India and that the scientific problems of their vast country can be and ought to be best solved by trained Indian brains on Indian soil. That is the object to which the Ranchodlal Madhavlal College of Science will be devoted and in years to come I am certain that it will spread benefit broadcast helping in the creation of new industries and in the development of those that have already taken root here, promoting the advancement of this important city and imparting clearer ideas of operations of natural laws and of their inexorable bearing upon human affairs to many students who will be trained within these walls."

The annual prize distribution and sports of the Armenian College, took place on Friday

Armenian
College
Calcutta

afternoon the 9th inst. on the grounds of Mr. J. C. Galstaun's premises in Lower Circular Road. Sir Lawrence Jenkins presided over a large gathering and Lady Jenkins gave away the prizes.

The report showed progress in all departments. An attractive programme of sports was gone through there being no fewer than seventeen events. These comprised races, high and long jump and tug of war, physical drill with arms by a squad of cadets, Indian Club Swinging and a scouting adventure by the college Scouts.

The College annual sports' Cup presented by

Mr. J. C. Galstaun, was awarded to C. C. Aparca as being the best all round sportsman.

Sir Lawrence Jenkins delivered a brief address expressing his great satisfaction with all he had seen that afternoon. While congratulating the boys on the satisfactory progress in their educational career, Sir Lawrence Jenkins expressed his great pleasure at the progress achieved in volunteering and commended the excellence of the scouting display by the cadets.

The celebration in connection with the anniversary of the foundation of the Serampore College takes place on Saturday, the 17th instant, in the College premises at Serampore.

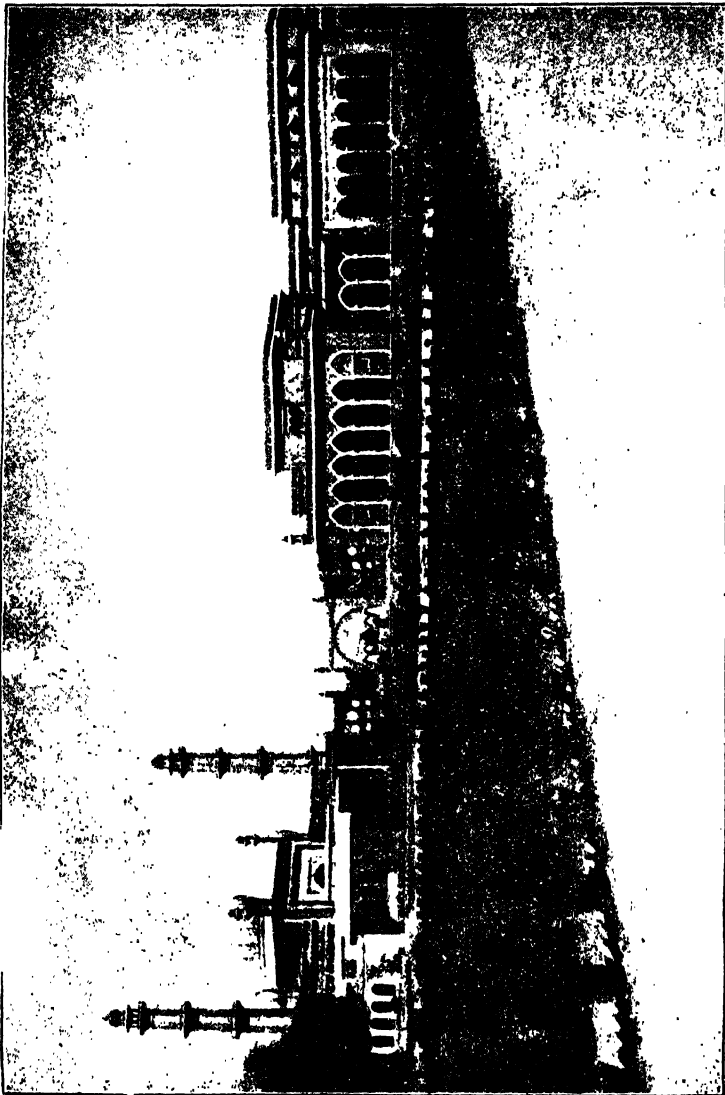
Serampore
College

The programme arranged includes a thanksgiving service in the morning, Athletic sports in the forenoon, followed by distribution of prizes to the successful competitors by Mr. A. K. Jameson the local Sub-Divisional officer, a public lecture by Professor J. R. Banerjee of the Metropolitan Institution, Calcutta, on "Carey's Educational ideals," afternoon tea, a public meeting under the presidency of Sir Ashutosh Mookerjee, at which the report of the College for the year 1911, will be presented. Mrs. Gee will distribute prizes to the pupils, and the Rev. R. Gee will give an address.

The annual meeting of the College Missionary Association will be held the next day (Sunday) at 2 p.m. The rest of the day will be devoted to Church service.

A meeting was held on Wednesday the 23rd of January 1912 in the College Hall to adopt measures to commemorate the memory of the late Hon'ble Rai Ramanuj Dayal Bahadur Secretary of the College. The Principal Mr. Jesse said that a portrait of the late Rai Bahadur will be provided for from the College funds; and the business of the meeting was to raise funds for (1) a memorial chair in Sanskrit and (2) a general memorial fund. The form the latter would take was not decided.

Meerut
College



THE NEUCLEUS OF THE PROPOSED MAHOMEDAN UNIVERSITY.
M. A. O. COLLEGE MOSQUE AND LECTURE ROOMS.
By the Courtesy of the 'ALIGARH MONTHLY.'



One or two State Technical Scholarships will be awarded in Bengal during the current year for the study of mechanical or Electrical Engineering, candidates should apply to the Director of Public Instruction Bengal not later than the 27th February 1912. The value of these Scholarships will be £150 per annum plus College fees and dues, and the Scholarship will be tenable in Great Britain, and with the approval of the Secretary of State in a foreign country.

One Scholarship under similar conditions will award in Electrical Engineering in the Madras Presy.; the last day of application being the 3rd March 1912.

OTHER EDUCATIONAL ADVANCES.

We would draw the attention of our readers to the appeal of H. H. the Aga Khan for funds for the Moslem University movement.

Twenty six lakhs have been collected and only nine lakhs more are wanted. We are glad to insert a photo of the M. A. O. College the nucleus of the would be Moslem University.

A largely attended open air meeting of Hindu citizens of Benares was held in the afternoon of January 31st in the Central Hindu College premises to raise subscriptions in aid of the Hindu University. The Maharaja of Benares presided.

The speech of His Highness the Maharaja of Benares was read by his son the Kunwar Shaib. After welcoming the deputation and commenting on the value of sound education which forms character, the Maharaja said that it was not all alike. The Maharaja subscribed a lakh.



At a meeting of the Executive Committee of the Governing Body of the Imperial College of Science and Technology Professor W. A. Cone, D. Sc., Ph. Science and D., F. R. S., Leeds University, was appointed Professor of Fuel and Refractory Materials in a new Department of Applied Chemistry of Chemical Technology now being established in the Imperial College at South Kensington. The subject of Applied Chemistry or chemical technology finds a fitting home in an institution concerned primarily with higher work in science, especially in its relation to industry. It is anticipated that additional professors will shortly be appointed to deal specially with other important branches of this subject. Professor Bone has filled the chair of Applied Chemistry at Leeds since 1905. He has made a high reputation in the subject of his chair including the technology of gas and fuel industries and metallurgy. He will take up his new duties at the Imperial College about September of this year.

The winter Conferring of Degrees of Dublin University was held in the Theatre of Trinity College on December 21, when a large number of degrees were conferred, on the results of the examinations of the term just completed. Maynooth College had its degree giving day on December 10, when Sir Christopher Nixon, Vice Chancellor of the National University, presided. University College, Dublin, held the inaugural meeting of its Legal and Economic Society on November 20, when the address of the Auditor Mr. P. O'toole, M. A. on "Union Finance and Home Rule," drew

The Hindu University Meeting at Benares

The Irish Universities

forth interesting and important speeches from Lord Mac Donnell and Mr. A. Samuels, K.C.; and the inaugural meeting of its Literary and Historical Society on December 12, when address on "The Dawn on the Hills of Ireland," by the Auditor Mr. John Ronayne, B. A., was followed by speeches from Mr. John Dillon, M. P., and Mr. T. W. Russel, M. P.

The following Indian and Burman gentlemen were successful at the general examination of students of the Inns of Court, held in the Middle Temple Hall on December 18, 19, 20, 21, and 22. L. I. denotes Lincoln's Inn, I. T. Inner Temple, M. T. Middle Temple, and G. I. Gray's Inn:—

Final Examination.—Class I (in order of merit): Asoka Kumar Roy, M. T. (3rd); Upendra nath Sen-Gupta, G. I. (4th); Manindra nath Mitra, L. I. (5th) (all awarded Certificates of Honour). Class II (in order of merit): Murari Prasad, M. T. (6th); Biswanath Mitra, M. T. (8th); Mukand Lal Puri,

M. T. (6th); Sudir Chandra Basu, G. I. (22nd), Class III (in alphabetical order): Hoosein Hasanally Abdoolcader and Zahirul Hassan Ahmady, L. I.; Syad Sayid Alam, G. I.; Basit Ali, M. T.; Khwaja Mohamed Atallah, L. I.; Maung Bah Shin and Naubat Rai Bhalla, L. I.; Satyendra Narayan Choudhuri, L. I.; Jeremiah Dina Nath Dass, L. I.; Kristnalal Datta, G. I.; Bhajan Lal Dhingra and Darab Cursetji Driver, G. I.; Dalip Singh Gill, M. T.; Mahomed Abdur Rashid Khan, M. T.; Mahomed Ashraf Ali Khan, I. T.; Muft Mahomed Ayub Khan, M. T.; Charan Singl Lall, G. I.; Saied Ross Masood, M. T.; Putham pilli Nelakanta Menon and Mir-Zynuddin, L. I.; Barjorjee Patel, M. T.; Singarayaloo Ruthnur Pather, L. I.; Abdul Rahman, L. I.; Clospe Bangalore Nagabhushana Rao, G. I.; Syed Ali Raza, M. T.; Tasadduq Ahmed Khan Sherwan and Kanwar Jusbir Singh, L. I.; Labh Single (ii), G. I.; Tara Singh, L. I.; Bhubaneshwar Prasad Sinha, M. T.; Mahomed Yusuf, L. I.

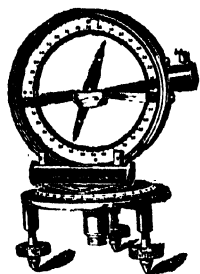


Fig. 4. Becker's Standard Dip Circle, adjusted to read within 1 degree in 8 different positions. Price £4 19s. 6d. strictly net.

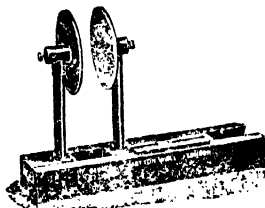


Fig. 32. Sliding Condenser with 4 inch plates and mm. scale, 15s.

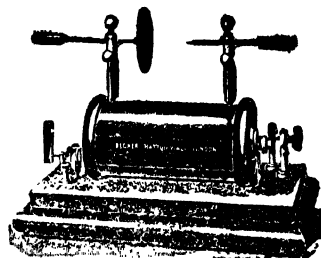


Fig. 14. Becker's Induction Coil for Colleges and Schools. Price £3 19s. 6d. Useful for several experiments, such as sparking eudiometer tubes, vacuum tubes, etc. Spark $\frac{3}{4}$ to 1 in. Furnished with condenser, special commutator, platinum break, and adjustable spark collectors.



Fig. 51. Brass Compass Box, with nicely balanced needle (agate centre), 15s.



Fig. 76. Pair of strongly made "Bow" Crucible Tongs, 8 inches long, price 6d.

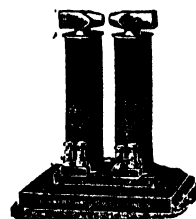


Fig. 47. Electro Magnet, 8 ins. high, cores 1 in. diameter, movable coils, £3 3s.

Japaned Tin with Mouthpiece. Price 4d.

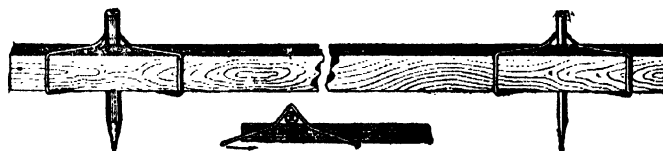


Fig. 22. Beam Compass, a sliding spring attachments, a needle divider points, pencil and lath 36 inch, 2-6.

Beckers. 17 to 27. Hatton Wall. London. E. C.

EMERSON FROM AN INDIAN POINT OF VIEW *

By Principal HERAMBACHANDRA MAITRA.

Of the eminent writers who are the exponents of the spiritual movement of the nineteenth century, those whose influence is most widely acknowledged—Wordsworth, Shelley, Carlyle, Emerson—have two notable characteristics: first, they either give a very subordinate place to dogma or reject it altogether; secondly, they lay great stress on truths which from remote antiquity have most deeply impressed the Oriental mind and have been uttered with the greatest power in the East. The influence of Wordsworth as a spiritual teacher will ever be felt, in spite of the "Ecclesiastical Sonnets," to lie, not in his championship of orthodox Christianity, but in his awakening men to a sense of the Infinite revealed in the finite and to a consciousness of the immanence of the divine Spirit in the outer and the inner world. These are the truths which inspire some of Shelley's noblest lines. They find utterance in Carlyle's wisest words. And they occupy the foremost place in Emerson's message to an unspiritual world. Hence the power with which Wordsworth and Emerson appeal to the oriental mind. They translate into the language of modern culture what was uttered by the sages of ancient India in the loftiest strains. They breathe a new life into our old faith, and they assure its stability and progress by incorporating with it precious truths revealed or brought into prominence by the wider intellectual and ethical outlook of modern spirit. Before I dwell at any length on the spiritual affinity between the teachings of the East and the mind of Emerson, it will be convenient to consider some of his intellectual traits, which give us a key to the right interpretation of his faith.

The success of a teacher in spreading his thoughts and principles depends more upon their inherent worth, the earnestness with which they

are presented, the feeling and imaginative associations they awaken, than upon the logical force of the propositions in which they are embodied. It is not those who are ready to support every statement by arguments, but those who appeal to the heart and imagination, that exercise the widest influence. Emerson belongs to this latter class. As an exponent of certain great ideas, he relies more upon the value of the ideas themselves than upon arguments. He seldom resorts to careful reasoning. This is partly due to the nature of the truths he teaches, which are almost unprovable and can only be apprehended by moral or spiritual experience. But it is also the result of the disposition of his mind. "I do not know," he says, "what arguments mean in reference to any expression of a thought. I delight in believing what I think, but if you ask how I dare say so, or why it is so, I am the most helpless of mortal men." He values insight more than clever reasoning. "It was a grand sentence of Emanuel Swedenborg," he says, "which would alone indicate the greatness of that man's perceptions: 'It is no proof of a man's understanding to be able to confirm whatever he pleases; but to be able to discern that what is true is true, and that what is false is false, this is the mark and character of intelligence?'" Himself gifted with extraordinary spiritual insight, this is the gift he most admires in others. After he had met Carlyle for the first time, he remarked that he had known many men of humbler intellectual powers who had a clearer spiritual vision than he. He says characteristically, "We know truth when we see it, from opinion, as we know when we are awake that we are awake." His bold counsel to the man who believes without being able to give a reason for it, is, "Trust the instinct to the end though you can render no reason." "Why should I give up my thought," he says, "because I cannot answer an objection to it?" "With consistency," according to him, "a great soul has nothing to do." "To great results of thought and morals," he tells Carlyle, "the steps are not many, and it is not the masters who spin the ostentatious continuity." Living in an age when an argument is

* First appeared in the Harvard Theological Review (October 1911).

demanding for everything, and when logical acuteness is considered the great mark of superior intelligence, Emerson not only prefers insight to the power to demonstrate, spiritual perception to flawless reasoning, but he boldly defends this preference. With him, as with every great spiritual teacher, the divine intuitions of the soul are "the fountain light of all our day."

While his utterances are deeply religious, his aversion to formal or logical statements keeps them free from the slightest tinge of dogmatism. He shows the most marked aversion to theological disquisitions, and has no sympathy with those who are perplexed by theological difficulties, which he thinks never presented a practical difficulty to any man,—“never darkened across any man’s road, who did not go out of his way to seek them.” Puzzling questions like original sin, the origin of evil, or predestination he regards as the “mumps and measles and whooping-coughs” of the soul. “A simple mind,” he declares, “will not know these enemies.”

Another remarkable trait of Emerson’s mind is its irresistible, ever-present tendency to see things in their entirety, to view everything in relation to the whole of which it is a part, in relation to the cause of which it is the effect, in relation to the idea of which it is the expression. Whatever is suggestive of large relationships has an attraction for him. Astrology interested him as it “tied man” to the universe. “Instead of an isolated beggar, the farthest star felt him, and he felt the star.” A circle made by a pebble in a pond sets him thinking of the paths of the planets. The long intervals between the letters he receives from a friend would make him impatient, “but that they savor always of eternity,” he says, and promise him a friendship not reckoned by years. He begins his essay on “Circles” characteristically: “The eye is the first circle, the horizon which it forms is the second, and throughout nature this primary figure is repeated without end.” In this he sees a hint, an outward symbol, of the nature of God, described by St. Augustine as a circle whose centre is everywhere and circumference nowhere. And thus the least things leads him up

to the thought of the Infinite, the Eternal,—for the light of this great Idea so lights the chambers of his soul that it is reflected back by everything he receives into his mind. His topics range from the Over-soul to farming; but whatever his theme he “hitches his wagon to a star,” to use a favorite phrase of his, and illuminates the homeliest subject by pouring a flood of spiritual light upon it.

The material, the visible, has no finality to Emerson. Its purpose is only to suggest the invisible, the spiritual. The humblest concerns of life are interpreted by him in the light of spiritual truths. The merchant’s economy is to him “a coarse symbol of the soul’s economy. It is to spend for power and not for pleasure. It is to invest income; that is to say, to take up particulars into generals; days into integral eras,—literary, emotive, practical,—of its life, and still to ascend in its investment.” The forms, speech, and manners of men and women who attract him have to him “a largeness of suggestion,” and they “carry a certain grandeur like time and justice.” Everything has a symbolic or suggestive character to him. Around every circle another can be drawn; this suggests to him “the moral fact of the Unattainable, the flying Perfect, around which the hands of man can never meet.” He views the present in the light of the future, the best experiences of our earthly life being to him a foretaste and an assurance of the blessed experiences that are to be ours hereafter. Milton, he says, anticipated the leading thought of Swedenborg when he wrote:

“What if earth

Be but the shadow of heaven and things therein,
Each to the other like, more than on earth is thought?”

This idea pervades his own thoughts, and hence the sympathy with which he interprets the genius of Swedenborg. To him the spiritual world alone is real; of that original the outer world is a copy; of that cause it is the effect; of that supreme reality it is a hint. He objects, however, to Swedenborg’s method of fastening each natural object to a particular Theological idea; for he says, “each individual symbol plays innumerable parts,” and “in the trans-

mission of the heavenly waters, every hose fits every hydrant." The high value which Emerson attaches to the spiritual interpretation of the outward world is strikingly shown by his verdict on Shakspeare, who, he regrets, rested in the beauty of out-ward things, without seeking to ascend higher and unfold their spiritual meaning. It needed courage to speak thus of Shakspeare. But he forgets that the cunning of the dramatist's genius would have failed him here. To Emerson such an interpretation of things seems easy, for it is a leaven that leaveneth all his thoughts. A pervading sense of the Infinite and faith in Mind as the supreme reality are among the most marked characteristics which Emerson and Carlyle have in common. Music leads the mind of the one to the edge of the Infinite. A beautiful face is to the other a key to the hidden meaning of the universe. The Steamship is the Scottish brass-smith's Idea sailing round the world, says one. The true ship is the ship-builder, says the other. They dissolve all things into thought, reduce all things to their primal origin—the Mind. Chemistry, vegetation, metals, and animals, are to them words of God.

This living faith in the Infinite, this insistent sense of the reality of the Unseen, makes Emerson a mystic in the noblest sense of the word. "By mysticism we mean," says Jowett, "not the extravagance of an erring fancy, but the concentration of reason in feeling, the enthusiastic love of the Good, the True, the One, the sense of the infinity of knowledge, and of the marvel of the human faculties." Something needs to be added to this. He is the mystic to whom the invisible is more real than the visible, who is haunted and waylaid by the thought of the Unseen, who yearns for the Infinite with a passionate yearning. It is mysticism to see more than most men into the depths of life, into the hidden things of the Universe. "Men live," says Emerson, "on the brink of mysteries and harmonies into which they never enter, and with their hand on the door-latch they die outside". The writer these words did not die outside. He had plunged into the harmonies. Hence was it that mysticism had

such a joy wreath him. He thinks the greatest attraction which London has for the imagination is that "in such a vast variety of people and conditions we can believe there is room for persons of romantic character to exist, and that the poet, the mystic, the hero, may hope to confront their counterparts." He regrets that the Swedenborgians in general "receive the fable instead of the moral of their Æsop"; still he finds them deeply interesting, and thinks they must "contribute more than all other sects to the new faith which must arise out of all."

That the best elements of mysticism may exist in absolute independence of the extravagance of an erring fancy is shown strikingly by the clearness of Emerson's intellect, by its sustained equipoise, its undisturbed faith in the reign of law, its sympathy with culture and with all that is essentially good in civilization. He says that the laws of nature play through trade as a toy battery exhibits the effects of electricity. The great lesson that natural science teaches us is 'the universality of law and "the continuation of the inflexible law of matter into the subtle kingdom of will, and of thought." The fact that the earth "never loses its way in its wild path through space" teaches us that a secreter gravitation, a secreter projection, rule not less tyrannically in human history. It is short-sightedness to limit our faith in laws to those of the physical world, for laws "do not stop where our eyes lose them." He unfolds the great thought which Wordsworth expresses so beautifully in his "Ode to Duty,"

"Thou dost preserve the stars from wrong ;

And the most ancient heavens, through Thee, are fresh
and strong."

the thought that all law is one, that the law of gravitation is but the law of duty translated into the language of atoms. He does not believe in luck, he does not believe in chance. Success, he holds, can only be attained by "close application to the laws of the world, and since those laws are intellectual and moral, by intellectual and moral obedience." The value of political economy is in this, that it teaches us "the ascendancy of laws over all private and hostile influences."

There is no element of caprice in the divine government of the universe. If he is a mystic, he is a clear-sighted one; nay, his mysticism lies in this, that he is able to see into the soul of things with an unclouded vision. Unswerving as is his faith in law, it only strengthens his faith in the goodness of God, it fills him with hope instead of depressing him. "Will not man one day," he asks, "open his eyes and see how dear he is to the soul of Nature,—how near it is to him? Will he not see through all he miscalls accident, that law prevails for ever and ever?" "When he perceives the law, he ceases to despond. Whilst he sees it, every thought and act is raised, and becomes an act of religion."

As Emerson's mysticism springs from keenness of vision, from a power to pierce through the mask of nature to the inner meaning of the universe, so is his religion, in its loftiest ascent, the noble product of a keen sense of beauty, which, like Wordsworth, Carlyle, Shelley, he possesses in a remarkable degree. What a noble tribute does Wordsworth pay to loveliness in his "Lines on a Highland Girl"! In *Sartor Resartus*, how does the bosom of Teufelsdröckh heave and swell under the power of Blumine; and Carlyle's impassioned homage to the beauty of the Princess de Lamballe is one of the most glowing pages in his *History of the French Revolution*. A divine discontent with all earthly beauty inspires Shelley's lines headed "The Question." Emerson calls a beautiful woman a practical poet who tames her savage mate, and plants tenderness, hope, and eloquence in all whom she approaches. He regards the refining influence of graceful and cultivated women as one of those elements of civilized life which contribute in a notable degree to the moral progress of the race. There is no monkish austerity in this saint. Beauty sends a thrill through his bosom which he is not ashamed to express. His "Ode to Beauty" could only have been written by one whose heart was pierced by the shaft of beauty. But he stands on a higher plane than Wordsworth, Shelley, and Carlyle in this, that with him the love of beauty is transformed into a spiritual passion, not occasionally, but as a constant

affection of the pure mind. The love of beauty, aided by the moral sentiment, enables him to realise vividly the loveliness of virtue. The contemplation of a masterpiece of art, he says, produces a state of mind which may be called religious. In Greek architecture he sees an image of the beauty of temperance. And in him the sense of beauty attains a still higher elevation, reaching the loftiest form to which it can ascend. By union with the sense of the Infinite, it is exalted into a longing for the beauty of God, as a dew-drop touched by sunshine becomes a proclaimer of the glory of the sun. To Emerson all finite beauty is a promise and a hint of the uncontained beauty of the Supreme Being. Lovely forms, he says, do not point to "any relations of friendship or love known and described in society," but "to relations of transcendent delicacy and sweetness," to what "roses and violets hint and foreshow." Then is personal beauty truly charming when it "suggests gleams and visions, and not earthly satisfactions." These sentences read like an exposition of Shelley's "Hymn to Intellectual Beauty." The influence of Plato on both Shelley and Emerson is marked. Plato in the *Symposium* leads the mind step by step up to the thought of the Infinite Beauty. Shelley breaks forth into a strain of impassioned utterance. Emerson presents that great idea to our minds in suggestions and affirmations which show that he lives and moves in the divine atmosphere of that thought. He does not approach Shelley in the power of poetic expression. But to him belongs the far higher gift of a steady faith in the Divine Beauty that rules his entire being.

In some of the intellectual characteristics we have noticed, in Emerson's pervading sense of the Infinite, in his tendency to see things in their entirety, in his faith in the reality of the Unseen, we have the source of the fascination which the religious thought of the East has for him. The appreciative references to it which fill his pages show the breadth of his mind, his keen eye for truth in whatever garb it may be presented, and his power to draw inspiration from all sources. He concludes his inspiring essay on "Immortality" with a fable from the *Katha-Upanishad*. In naming his produc-

tions he has in two instances borrowed words from the East,—the poem "Brahma," and the essay on "The Over-soul" in which he perhaps reaches the climax of his power both as writer and as a spiritual teacher. "Over-soul" is really the translation of a Sanskrit word, and the English language is indebted to Emerson for having enriched its vocabulary with a word of deep spiritual meaning. In this choice of names we have an indication of reason of the attraction which ancient Hindu thought has for him. The thought of the One in the many, the thought of the Infinite revealed in the finite, which broods over his mind like

"a master o'er a slave,

A presence which is not to be put by,"

is expressed with greater power and beauty in the sacred books of ancient India than anywhere else. "In all nations," says Emerson, "there are minds which incline to dwell in the conception of the fundamental Unity. The raptures of prayer and ecstasy of devotion lose all Being in one Being. This tendency finds its highest expression in the religious writings of the East, and chiefly in the Indian Scriptures, in the Vedas, the Bhagavad Gita, and the Vishnu Purana. These writings contain little else than this idea, and they rise to pure and sublime strains in celebrating it." Of his poem "Brahma," which is the expansion of a line of the *Katha-Upanishad* reproduced in the *Bhagavad Gita*, Professor Lanman says: "The doctrine of the absolute unity finds perhaps its most striking expression in Sanskrit in the *Katha-Upanishad*; but nowhere, neither in Sanskrit nor in English, has it been presented with more vigor, truthfulness, and beauty of form than by Emerson in his famous lines paraphrasing the Sanskrit passage."

The thought of a Unity underlying all variety colors all his ideas. Speaking of works of art, he says, "What astonished and fascinated men in the first work astonished me in the second work also: that excellence of all things is one." The ultimate fact which we reach on every topic is, he says, "the resolution of all into the ever-blessed One." His language occasionally shows that tendency to merge the many altogether in the One, which is

the basis of pantheism, and which so strongly characterizes the religious literature of ancient India. "The act of seeing and the thing seen," he says, "the seer and the spectacle, the subject and the object are one. We see the world piece by piece as the sun, the moon, the animal, the tree; but the whole of which these are the shining parts, is the soul." These sentences remind us of the following passage of the *Chhandogya-Upanishad*: "Where one sees nothing else, hears nothing else, understands nothing else, that is the Infinite. Where one sees something else, hears something else, understands something else, that is the finite. The Infinite is immortal, the finite is mortal."

In reading Emerson, we feel that at times the thought of the Infinite rushes on like a sweeping tide and carries everything before it. But in order to interpret such utterances rightly we must take them together with others which supplement and qualify them; and we must bear in mind that they are the expressions of a flowing current of thought or spiritual emotion, not rigid statements of a creed or dogma. Beautiful expressions of intense religious emotion become prolific sources of error when the only key to their right interpretation—the glow of imagination or spiritual fervor which inspired them—is lost, and they are applied literally and stiffened into articles of faith. Hence the apotheosis of man and the doctrine of Incarnation. Hence too the pantheistic doctrine of the absolute unity of man and God. "The religions of the world," says Emerson, "are the ejaculations of a few imaginative men." No, they are far more. But the ejaculation plays a very important part in them. And too often, while they are remembered, the feelings from which they sprang are lost. Men are thus led astray from the truth. The careful reader of Emerson can have little excuse for such misinterpretation of his teachings. If he sometimes seems to lose his balance, he soon recovers it. He keeps his thoughts in a perpetual flow, never allowing them to harden into a particular form; and he freely expresses every thought as it arises, without caring for consistency. With all his admiration for the

mystic, he condemns him because he "gails a symbol to one sense" and "takes an accidental and individual symbol for an universal one." "The universe is the externization of the soul," he says. "The soul feels that the grass grows and the stone falls by a law inferior to and dependent upon its nature." Again: "The world is the perennial miracle which the soul worketh." But we recover our breath when we read: "The mind does not create what it perceives, any more than the eye creates the rose." His most serious utterances on the relation of the human soul to God clearly assert the fundamental tenet of spiritual theism,—the union, not the unity, of the human soul and the Infinite Spirit: "Let man, then, learn the revelation of all nature and all thought to his heart; this namely, that the Highest dwells with him." "The soul gives itself, alone, original, and pure, to the Lonely, Original, and Pure, who on that condition gladly inhabits, leads, and speaks through it." Perhaps the most explicit statement in all Emerson's writings on the nature of the relationship of the human soul to the Infinite Mind is the following: "Man begins to hear a voice that fills the heavens and the earth, saying that God is within him. . . . I find this amazing revelation of my immediate relation to God, a solution of all the doubts that oppressed me. I recognize the distinction of the outer and the inner self; the double consciousness that within this erring, passionate, mortal self sits a supreme, calm, immortal mind, whose powers I do not know; but it is stronger than I; it is wiser than I; it never approved me in any wrong; I seek counsel of it in my doubts; I repair to it in my dangers; I pray to it in my undertakings. It seems to me the face which the Creator uncovers to his child." Here he beautifully unfolds a well-known thought of Hindu theology,—a thought allegorically expressed by the soul and the Over-soul being likened to two birds dwelling together on one tree.

Passages like the above clearly show that Emerson's denial of the personality of God means an affirmation of the divine infinitude, not a denial of consciousness or intelligence as an attribute of the Supreme Being. To him, as to many others, the

idea of personality is associated with that of limitation. "We cannot say" he declares, "God is self-conscious or not self-conscious, for the moment we cast our eye on that dread nature, it soars infinitely out of all definition and dazzles all inquest." He understands personality to mean finiteness. Nay, he even associates that idea, as we see from a passage in his essay on "Immortality," with the lower impulses and selfish instincts of human nature. But the essential meaning of personality is mind, thought, consciousness; and this he affirms of the Supreme Being in the clearest manner. What can be meant by "seeking counsel" of an unconscious being in one's doubts? In his essay on "Self-reliance" he gives us this advice: "In your metaphysics you have denied personality to the Deity, yet when the devout motions of the soul come, yield to them heart and life, though they should clothe God with shape and color." And he yields heart and life to his own devout motions, which bring with them a clear revelation of the divine mind. Nay, with him faith in the Supreme Intelligence is an abiding conviction not affected by the tides of the inner life. "We lie," he says, "in the lap of immense intelligence, which makes us receivers of its truth and organs of its activity." He teaches us to seek intellectual inspiration from the Infinite Mind. He hears the comforting voice of God when bowed by bereavement. There can, in fact, be no clearer affirmation of the sacred right of communion with the Supreme Mind which belongs to every human soul than we have in the teachings of Emerson. And it is in communion that he, like Plato and the seers of ancient India, has a revelation of the glorious truth of immortality. Every man, he says, parts form the contemplation of the universal and eternal beauty "with the feeling that it rather belongs to ages than to mortal life." This is the experience that inspires the utterance of the Hindu sage: "By knowing Him alone does one pass beyond death." "What," Emerson writes to Carlyle, "have we to do with old age? Our existence looks to me more than ever initial. We have come to see the ground and look up materials and tools."

begun. What a wealth of faith belonged to him who could say with unquestionable sincerity, "We are all great, all rich, in God" !

In Emerson's capacious nature there is room for the expansion and alertness of the West, as well as the concentration and serenity of the East. While he has a pervading consciousness of the Infinite as the supreme reality, he also recognizes the reality of the individual soul. He has in a large measure the polarity which he attributes to Plato. "A man is a centre for nature," he says. "If there were any magnet that would point to the countries and houses where are the persons who are intrinsically rich and powerful, I would sell all and buy it, and put myself on the road to-day." He speaks most impressively of the value of human endeavor, of the need of using aright the opportunities of the passing hour, of the supreme importance of training the will. To the seeker of spiritual enlightenment his advice is, "Work and live, work and live." "Sufficient unto the day are the duties thereof," he says. "A man is relieved and gay when he has put his heart into his work and done his best ; but what he has said or done otherwise shall give him no peace." "Do your work and you shall reinforce yourself." These are precepts which we in the East should inscribe on the tablets of our hearts. His ideal is the absolute harmony of work and worship, attained through perfect obedience to the divine will. Speaking of self-reliance, he says, "Let us not rove ; let us sit at home with the cause." On the first page of his essay on "Self-reliance," we have the following beautiful sentence: "A man should learn to detect and watch that gleam of light which flashes across his mind from

within, more than the lustre of the firmament o' bards and sages." This inwardness, this attitude of listening for the accents of the soul, is of the East. "You are," he says, "preparing with eagerness to go and render a service to which your talent and your taste invite you, the love of men and the hope of fame. Has it not occurred to you that you have no right to go, unless you are equally willing to be prevented from going ?" This, like Milton's line,

"They also serve who only stand and wait,"

is the very essence of the noblest ethical teaching of the *Bhagavad Gita*. For whatever the practice of the East may have been, the precept "work is worship" could not be more impressively inculcated than it has been in the *Gita*. With these devout spirits duty is but a form of communion. It must be acknowledged, however, that at times Emerson yields to optimism of the Oriental type and underestimates the need of human effort. He tells Carlyle that the truth can very well spare him and have itself spoken by another without leaving it or him the worse. Speaking of reformers he says: "Many a reformer perishes in his removal of rubbish, and that makes the offensiveness of the class.....They expend all their energy on some accidental evil, and lose their sanity and power of benefit. It is of little moment that one or two, or twenty, errors of our social system be corrected, but of much that the man be in his senses." Such language is disheartening. A man may well be forgiven a little flurry when his neighbor's house is on fire. But such an attitude on his part is due, in some measure at least, to the insincerity and vanity he sees in many of those who assail existing institutions. And some of the most notable acts of his life are impressive object-lessons on the duty of courageous and active resistance to wrong. How noble and inspiring is the remonstrance addressed by him to the President of the United States when the Cherokees were about to be expelled from the state of Georgia ! And, when Lovejoy was killed by a pro-slavery mob, we are told by eye-witnesses that Emerson's reference to him in a lecture as one who had fallen a martyr for the rights of free speech made

a cold shudder "run through the audience at the calm braving of the current opinion." Great events powerfully affect great minds. The French Revolution made Edmund Burke lose his balance. The conflict with slavery enabled Emerson to gain the balance which he sometimes lacked. Dr. Garnett says that what rescues Emerson's optimism from moral indifference of the Oriental type is the fact that "his writings are full of the loftiest lessons of renunciation." But renunciation could nowhere be more impressively inculcated or practised than it has been in the East. It is righteous indignation and insistence on the value of human effort that deliver Emerson from moral languor. His faith in the greatness of man's destiny, his lofty ideals, and his sincerity inspire him with a passion for moral and spiritual freedom which nothing can subdue. To his own ideal he clings with unswerving fidelity. When he "rests in perfect humility," when he "burns with pure love," Calvin or Swedenborg has nothing to teach him. He feels that before the immense possibilities of the human race and of every individual soul, the greatest men the world has known shrink into nothing. He laments that even a Jesus should be "confounded with virtue and the possible of man". This prophet has a stern independence, though he speaks in gentle accents and his bearing is meek. In this union of meekness and courage, of freedom and reverence, of an eager acceptance of the heritage of the past and a conviction that greater things belong to the future, of faith in an all-pervading Deity and a sense of the reality of human life and the responsibility of man, we have a most striking example of the harmonious union of the modern spirit with the noblest teachings of ancient times.

In India the influence of Emerson has been deeply felt by many of those who have received Western education. It would be well if his influence extended to larger numbers. But the loftier the aims of the teacher, the smaller the band of disciples; and many, it must be admitted, are repelled by the peculiarities of Emerson's style. At a time when Western ideas have such a fascina-

tion for us, we need the aid of such teachers in discriminating between what is wholesome and what is hurtful in them. He is one of those wise men who, while they have amply participated in the intellectual activity of their day, have resisted and rebuked its vices and follies, and who have contributed in a large measure to its noblest moral and spiritual tendencies. Amidst the perplexities created by the conflict of the past and the present, of the East and the West, he is a safe guide; and amidst the depressing influences of life he is an unfailing source of strength and inspiration.

The invaluable service that Emerson renders to us is that he recalls us from the vanities of life to its abiding realities. His power as a spiritual teacher lies mainly in the fact that every word he utters comes from his inmost heart, and he is himself loyal to the high ideal he sets before others. He awakened noble intellectual aspirations in others by his pen and voice; and he was himself gifted with a powerful intellect and a deeply thoughtful mind which were consecrated to study and high thinking. He said that love is the affirmative of affirmatives, and no man had a more tender heart than he. He was full of boundless hope for the future of the human race and of every individual soul. He was guided and inspired by unfaltering faith in the divine goodness and beauty; he was cheered by steady hope; and his was a love which, while it flowed freely forth on all sides, was in the intimate relationships of life tremulous with emotion tender as woman's.

Carlyle would often send across the Atlantic his illustrious friend the brief but significant query, "Watchman, what sayest thou?" Next to seeking counsel of God, we cannot do better than turn to such a watchman, and ask him in all seriousness, "What sayest thou?"

NUMERICAL NOTATION.

One of the grandest achievements of the Hindoos and the one which, of all inventions, has contributed most to the general progress of human knowledge, is the invention of the system of *numerical notation*, we have in common use now. This present system of notation is by far superior to all the ancient systems, all of which were much more cumbrous and burdensome to the memory. Among the ancient Greeks the *alphabetical numerals* were in use. In that system the letters of the Greek alphabet, taken mainly in their alphabetical order, were divided into three groups, of which the first represented the units (1, 2, 3, etc up to 9), the second the tens (10, 20, 30 etc up to 90), and the third the hundreds (100, 200, 300, etc up to 900). Now the Greek alphabet consists of only 24 letters, and so three additional characters were invented. At 1000 the alphabet was began over again, but to prevent confusion a stroke was this time placed before the alphabet. Thus α^1 would represent 1000. By thus using strokes the Greeks represented the thousands (1000, 2000, 3000 etc up to 9000). The number 10,000 was represented by the letter M. The principle employed by the ancient Greeks in writing numbers was both the *additive* and the *multiplicative—additive* up to 10,000 and *multiplicative* beyond 10,000. For instance, $\mu\beta$ would represent 42, μ standing for 40 and β for 2; but 20,000 would be represented by βM or $M\beta$, and not by MM. The Greeks used to represent fractions by first writing the numerator marked with an accent, and then the demoninator marked with two accents and written twice. Thus, $\frac{2}{3}$ they wrote as $\beta'\gamma''\gamma''$, γ standing for 3. To distinguish the numbers readily from words they used to draw horizontal lines over letters representing numbers.

The Roman notation also employs the letters of the alphabet, but is not based upon alphabetical order. This system makes use of fewer characters but greater combinations than the Greek system. One (I) is repeated up to four; to the new charac-

ter for five (V) one is repeated up to eight; ones are again added to the ten-character (X); at 15, five enters, and so at 25, etc; for the tens up to 40 the ten is repeated, and so on—the symbols I, V, X, L, C, D expressing all the numbers by regular combinations up to 1000 which is represented by M. Thus for instance, 75 is expressed by LXXV. There is again a remarkable peculiarity in this Roman system. It contains some subtractive forms, *viz*, IV (4), IX (9), XL (40), XC (90).

By the ingenious deciphering of the Egyptian hieroglyphics an insight has been obtained into the Egyptian method of numeration. In that system different orders of numbers were expressed by different symbols—the symbol for 1 representing a vertical staff, that for 10,000 a pointing finger; that for 100,000 a burbot, that for 1,000,000 a man in astonishment, and so on. The writing of numbers with these hieroglyphics was very cumbrous. The principle employed by the Egyptians in writing numbers was *additive* the unit symbol of each order being repeated as many times as there were unit in that order. Thus, 200,000 was expressed by two burbots placed side by side.

Superior to all these ancient systems is our present system of numerical notation. This notation is generally called the "Arabic" notation. But this clearly is a misnomer. The invention of our present system of arithmetical notation is due really to the Hindus of India, and not to the Arabs. The Arabs simply formed a medium of transmission of the notation from the Hindus, and from them the Europeans got it. This has been admitted even by some of the most eminent Arabic writers, among whom may be mentioned the name of the illustrious Arabic mathematician Al Biruni. He flourished in the latter part of the 10th Century and in the earlier part of the 11th Century of the Christian era, and spent a good many years in India. Thus Al Biruni writes,—“The shape of the numerals, as also of the letters in India, differed in different localities, and the Arabs selected from various forms the most suitable.”

The numerical notation in use now should, therefore, more appropriately, be called the "Hindu" notation, and not the "Arabic" notation.

Before the time of Mohammed the Arabs had no numerals at all. Numbers were written out in words. Later on, as the Arabs conquered the more civilized countries they retained in those places the notations they then found prevalent there. Thus in Syria, the Greek notation was retained. Gradually coming more and more in contact with the Greeks, they, in analogy to the Greek system, began to employ the 28 letters of Arabic alphabet for numerals. This system of the Arabs goes by the name of *Absad*—a word formed by the combination of the first and the last letter of the Arabic alphabet—system. This notation was in turn superseded by the Hindoo notation.

Although it has been ascertained beyond doubt that the present numerical notation is of Indian origin, it is very difficult to say with certainty who invented it and when he invented it. One fact, however, is evident that it did not spring into existence all on a sudden from the head of any particular individual. It must have taken centuries to come to the present form of perfection. The nine figures for writing numbers are supposed to have been introduced earlier, and the sign of zero and the principle of position later on. In the Island of Ceylon we still find a notation resembling our own, but without the zero. Indian culture was transplanted into Ceylon with the spread of Buddhism there so far back as about the third century after Christ; but this culture remained stationary there, while it made progress in India. Hence it is not unlikely that the numerals of Ceylon are the old, imperfect numerals of India. In Ceylon, nine figures were used for the units, nine others for the tens, one for 100, and also one for 1000. These 20 characters enabled them to write up all the numbers up to 9999. These Shinghalese signs are supposed originally to have been the initial letters of the corresponding adjectives. This notation of Ceylon bears a marked resem-

blance to the one used by Aryabhatta in the first Chapter of his famous work *Aryabhattiyam*. Although the zero and the principle of position were unknown to the scholars of Ceylon, from the above work of Aryabhatta it can be safely inferred that both of these were not unknown to him. Now as to the precise time when the zero and the principle of position were actually invented we cannot make any definite assertion. But this much we can say with certainty that they were invented prior to the fifth century of the Christian era, since both were known to Aryabhatta who flourished in the fifth century, and both held an established position even then. Again as to the times when the Arabs borrowed the notation from India and when they transmitted it to Europe the authorities are not also definite. So far, however, can be inferred from the authorities on the subject that it was known to the Arabs in the 9th century and to the Italians in the beginning of the 13th Century.

The present System of notation was not the only System known to the Ancient Hindoos. There were, in fact, several different notations in use in different parts of India. They, however, differed, not in principle, but in the forms of the signs employed. In one of the systems—an interesting one—the figures were generally expressed by objects suggesting the particular numbers in question. Thus, for 1 was used the words *moon*, *earth*, *creator*, or *form*; for 2, the word *wing* (a bird having only 2 wings); for 3, the word *world* (there being 3 worlds according to the Hindoos, viz, celestial, terrestrial and nether); for 4 the word *veda* (there being 4 vedas); for 5, the word *arrow* (the god Cupid of the Hindoo mythology, having 5 arrows); for 6, the word *philosophy* (there being 6 Schools of Hindoo Philosophy); for 7, the word *sea* or *mountain* (there being only 7 seas and 7 mountain chains according to the Hindoos); for 8, the word *Vasu* (Vasu being a class of 8 gods according to the Hindu mythology); for 9, the word *planet* or *digit* (there being 9 planets as also 9 digits); for 10, the word *incarnation* (God having incarnated 10 times according to the Hindoo mythology); and so on.

The following is an interesting illustration from the *Surryasiddhanta*. The number 1,577, 917, 828 is expressed from right to left thus : Vasu + two + eight + mountain + form + digit + seven + mountain + paksha (a *paksha* being consisted of 15 days). By this method even very large numbers could be written.

The invention of the numerical notation is not the only achievement that speaks of the prodigious intellect of the Ancient Hindoos. Their innovations and inventions in other branches of Mathematics also are of no mean importance. In Mathematics, and specially in Astronomy, they climbed to a very lofty height. Their Arithmetical operations and Algebraical methods were as perfect as our own. Dr. Cajori has, therefore, very appropriately remarked, "Think of that most perfect of Mathematical symbols—the Hindoo notation, think of the Indian Arithmetical operations nearly as perfect as our own, think of their elegant Algebraical methods, and then judge whether the Brahmins on the banks of the Ganges are not entitled to some credit".

S. R. PAL.

THE INDUCTIVE METHOD OF TEACHING—II

(Continued from Page 280)

III. Geography.

Geography is 'the physical basis' of the historical science, and history is imperfect without geography. As the mind has its basis of operations in the body, so also this physical world is the stage on which the human beings play their parts. Imperfect will be our knowledge of human life and society if we neglect to study the natural surroundings and the physical environments which to a great extent regulate and govern the character of the field of human habitation and activity. A knowledge of geography as the science of these physical agencies is thus a preliminary to the study of the activities of men.

In geography as in history we must proceed from the known to the unknown, the familiar to

the unfamiliar, the near to the distant. The geography of our native land must first attract our attention. If we are ignorant of the rivers, forests, plants, animals, industries, trade and commerce of our mother country we cannot expect to have a living conception of the physical and geographical characteristics of other countries, for it is only by reference to one's own self, to the existing stock of ideas, by *apperception* as it is called, that our knowledge becomes real, effective and living.

In order that one may receive and entertain guests and offer hospitality to strangers one should be a householder and have a 'home.' If, however, one has no local habitation, no centre of affection, no fixed points round which to group associations and ideas, even a most diversely varied life and the experiences of many lands and peoples cannot leave him wiser and more informed, for these cannot stay and vanish as soon as they rise.

The concrete geographical forces and features should demand the attention of the student in the beginning. Such abstruse truths as those regarding the influence of environment upon society or the reaction of man over nature must not be discussed by the beginner. He should rather equip himself with a sound knowledge of the physical characteristics of his motherland and other countries in the order of importance or social or natural connections. In doing so the student of geography, should gather information about the lithosphere, hydrosphere and the atmosphere of the various regions of the globe *i. e.*, about those natural agencies and physical forces in land, water, air, etc., that influence a nation's social, political and religious institutions and that form the economic resources of a country. A knowledge of concrete and familiar things that lie about him will gradually lead him to the discovery of the subtle principles of geography as a Science.

IV. Mental and Moral Sciences.

The method of studying the historical science is to be applied to the other human sciences also, *e.g.*, Logic, Ethics, Economics, Politics, Psychology and Sociology. The subject matter of these

sciences is human mind and character—the ideals and institutions of man, and as such is very complex and intricate.

On account of the complexities and ramifications inherent in the mental and moral phenomena these sciences have an abstract subtlety and a metaphysical character peculiar to themselves. The method of proceeding from the concrete to the abstract and the familiar to the unfamiliar is, therefore, specially necessary in mastering these sciences. The mental processes and products, facts and phenomena of the moral world, economic institutions and organisations, political and social movements are the concrete materials that should first demand attention. Generalisations have to be deduced out of them, universal principles enunciated in subsequent stages after a careful analysis of the individual cases and comparison and contrast between them. Not the laws but the facts, not general principles but particular events of mental and moral life, economic and political world, are to be regarded as the proper subject of study.

Instead of taking a few facts and isolated events as illustration of the principles, those events and facts should be the primary topics for discussion and study; and the principles should be gradually drawn from them as subsidiary and auxiliary. The universal principles and the highest generalisations of the human sciences have to be deduced in this way out of the concrete world of the particular human and social phenomena.

Thus, to arrive at the laws underlying the the operations of the human mind, the connexions between the various classes of mental phenomena and the psychological growth of man, the student must be well grounded in a knowledge of the diverse thought processes, emotional and volitional conditions of man, and analyse and compare the multifarious sensations, perceptions, conceptions, judgments, decisions, affections and desires that go to make up the psychical life of man. These diverse mental experiences are the materials of the science of psychology, and the learner should thoroughly familiarise himself with this diversity and variety in order that he may have a sound

preparation and adequate equipment for the unities and common principles.

The student of ethics should likewise equip himself with a knowledge of those instances of human conduct which are generally described as right, and those which are condemned as having infringed on the rules of morality. In order that he may come to a correct view regarding the rightness and wrongness of things, the true standard of judgement and the principles that should regulate human actions, the student must be well grounded in concrete specimens of sins and virtues and the ideals underlying men's everyday judgment of things and events.

Similarly the student of the science of the "regulative principles of thought" should begin with an account of various specimens of right thinking and fallacious reasonings, instances of good argumentation and lunatic, inconsistent or irrational statements, and should acquire a knowledge of the various standards by which people in everyday life judge of human thoughts as correct or erroneous. When the number of cases is sufficiently large he will be in a position to compare the correct with the incorrect, and the truth with the untruth, and master the general principles on which men's conceptions of right and wrong thinking are based.

The actual manners, customs and usages of various peoples, their rites and ceremonies must receive the student's fullest consideration if he wants to discover the spirit that underlies them; to the student of sociology these facts and phenomena of social life, the institutions and practices through which man displays his inner nature and spiritual characteristics have the greatest importance.

Economics should be learned by observing the various institutions of property and industrial organisation that come into being in different ages in different countries. In this connection a close examination of the industries, arts, trade and commerce must be resorted to, and the facts and phenomena of the production, distribution, consumption and exchange of wealth and all such concrete incidents as make up the material life

of a people should be studied by the beginner. He should then generalise these occurrences of everyday economic life into principles of economic science.

Political science also has to be mastered by observing the real political events and the actual incidents of constitutional life of a people and by comparing highly advanced political societies with fallen nations. A preliminary discussion of the various forms of constitution and governmental machinery and of the political events of the past and present in this connection is indispensable to students of political science. They should also analyse the causes of conflict between self-interest national interest as well as conflicts between nation and nation and study also the many solutions that have been arrived at in history by treaties, charters and conferences.

Moral, spiritual, political and economical questions arise in the communal, social, political and other aspects of every individual's life. These questions of the human world gave rise to problems of truth and falsehood, good and evil, religion and irreligion, progression and retrogression, profit and loss, war and peace, amity and enmity, victory and defeat, respect and insult. Solutions of such universal problems have been attempted at by all men in their lives. Accounts of revolution and evolution embodied in history throw light upon these questions, and poets and dramatists have assayed to answer these questions through their art according to their capacity and inclination. It is these problems of human life that the students of philosophy should grapple with and analyse and dissect in order to discover ultimately the laws underlying the multifarious occurrences of the human world. The student should be well up in the facts and master and marshal them well before he undertakes in his own way to explain or account for them and discover their causal relations.

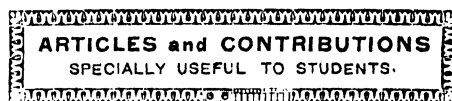
The student's attention is drawn to the fundamental elements and the basic foundations of language, history, geography, philosophy, economics and politics when these literary

subjects are studied on this inductive method. By being always in touch with the concrete data of the human sciences, the historical, philosophical and literary faculties of the student are properly exercised and receive their adequate development.

This method may also be adopted with considerable advantage in the study of mathematics and natural sciences; it affords opportunities to the students for the development of mathematical sense and creation of an interest in original research. The inductive method as described above adequately sets at work those faculties of mind by the exercise of which mathematics is mastered and a desire for questioning Nature is generated.

(*To be Continued.*)

B. K. SIRKAR.



THE ENGLISH —LANGUAGE AND HISTORY. INTRODUCTORY.

The language, living among two of the greatest nations in the world, has a history as much instructive, as interesting. *English*, which is mainly the language of the British Isles, is essentially the language of a tribe dwelling in the northern coast of Germany.

The original inhabitants, (at least, as far as anything is known of them) were the Celts, who were made up of two branches—the Gaels and the Cymries. The present language was nowhere in Britain at that time. Of the Celtic race very little is known, which is of any importance.

Julius Caesar invaded Great Britain in 55 B.C., and there found the Cymric branch of the Celtic family. He continued his work of conquest to the following year. But though he went a little into the interior, and established his domination

exacting payment of tributes from the inhabitants, yet the sum total of his activities was, rather, discovery of the island, for the benefit of the future generations, than possession of the same.

For a little over a century after this, the Britons remained unmolested by the Romans. But from 42 A. D. to more than fifty years subsequently, they were again subject to the attacks of the Romans, who gradually obtained possession of provinces as far as the Firth of Forth. In course of time, the Romans established themselves in Britain. Colonies were established; roads were constructed; and towns were fortified. The laws and custom of the Romans were quietly adopted by the Britons and Latin language and literature were universally favoured by the educated classes and the city-dwellers. A large number of Latin words were assimilated in the native language and *Welsh* was naturally reduced in position, being prevalent only among the lower classes. The *welsh* of Wales is the modern representative of the ancient celtic tongue.

Thus, by various ways and means, the Britons were Romanised, to their own disadvantage. But the Celts of the Welsh and Cumbrian borders and the Picts of Scotland, whose mountainous regions were inaccessible to the Roman invaders, retained their tribal peculiarities, and gave no end of troubles to their Romanised brethren. Still so great was the influence of the Roman civilisation, that even the language of these semi-barbarous people received the stamp of Rome, though these tribes persistently refused to follow in the footsteps of their denationalized peers. The great Northumbrian wall, with a number of military towns were built to check the incursions of Picts. But, when in the fifth century, the Roman troops were withdrawn from Britain to save the sinking Western Empire from the attack of its barbarian enemies, the state of Latinized Britons, were simply unenviable. Having been perfectly tricked out of their native valour by the dazzling influence of Roman Civilisation, they found themselves utterly helpless to cope with the terrible exigency that faced them—the aggression of their more formidable brethren. Thus handicapped, for

their own fault, and rendered helpless in danger, the wretched people sought the assistance of some extraneous force, to put down their intolerable associates. About the middle of the fifth century, they invited the aid of the Teutons, dwelling in the northern coast of Germany. They came and put down the offenders; they did more, for "they ended at last by conquering the country, they had come to save."

The conquest, however, was no easy task, after all, and a matter of one day. The native population resisted and failed and were ultimately driven towards the west coast of the island. At the beginning of the ninth century, the only parts of the country, that were still under the direct sway of the natives were *West Wales* ('Cornwall') *North Wales* ('Wales'), and a strip along the north-west coast of England and south-west coast of Scotland.

These Teutonic invaders were Low Germans, belonging to three tribes—the Juts, the Angles, and the Saxons. They succeed in establishing the seven Kingdoms, known in English history as the *heptarchy*, and it is the language of these Teutons, which, after having passed through a numerous strata of time, has reached us as the modern English language,

The invaders were not only fighting with the native Celtic inhabitants, but they were also contending among themselves,—one Kingdom against another in order to establish the supremacy of each. Now one kingdom raised itself up; the next day, it sank into insignificance, while another became dominant. These constant hostilities came to an end in 802, when among all others, kingdom of Wessex, became supreme. This was when Egbert was on the throne of Wessex.

Linguistic supremacy followed political sovereignty. Of the four Teutonic dialects—*Mercian*, *Northumbrian*, *West-Saxon* and *Kentish*, the *West-Saxon* became the pre-dominant language, others having sunk to the position of local or provincial dialects or of *patois*.

The *West-Saxon* retained its supremacy till the Norman Conquest in 1066. It had a splendid literature, represented by the epic of "Beowulf,"

Caedmon's Bible stories, the *Exeter Book*, and the *Vercelli Book* and the *Anglo Saxon Chronicle*. This last is the record of the reigns of all English Kings running down to the death of Stephen in 1154. The *English* of the Anglo-Saxon period did not fail to be influenced by the native Celtic tongue; by the Latin tongue chiefly through the agency of the Roman missionaries, who came to Britain in 1597, headed by St. Augustine; and the Scandinavian tongue, for which the Danish invasion (787) is responsible.

The latter half of the eleventh century saw a most momentous event in the history of England. The Norman Conquest introduced the French language into British Isles as its leading language. Or, it would be more correct to say, the Norman Conquest compelled the work, which had been going on steadily before the Battle of Hastings. Norman language and literature were being introduced into England chiefly through the activities of Edward the Confessor, but the old Saxon tongue had never been supplanted before the Norman conquest.

The Normans belonged to the same stock as the English themselves. They were *North-men*. In the tenth century A. D., a band of North men under a leader named Rolf or Rollo sailed up the Seine and began to plunder the inhabitants, and thus carried on continuous warfare with the native French. At last, in 912, by a mutual agreement with the French King, Charles the Simple, these intruders settled themselves on a large territory, bordering upon the English channel, which territory was henceforward called after them, Normandy. They also adopted the Christian faith and in course of time, virtually became French in manners, custom, usages and in language. These people were called *Norman-French*. They lived there, as in their country, peacefully for about a century and a half. Such being the state of affairs on one side of the channel, the other side was the territory of King Ethelred II. In 1002, this King married the sister of Richard II, the fifth Duke of Normandy. Thus the two great royal houses, reigning over the two shores of the English channel, were united by matrimonial

alliance. An issue of this marriage was Edward the Confessor, who was called to the throne of England in 1042, on the termination of the Danish dynasty. Edward, who had lived in the French Court, being called to sit on his father's throne, very naturally had developed a partiality for the Norman-French. Here began the first rise of the Normans, which culminated in their complete supremacy, as the result of the Battle of Hastings. Edward appointed Norman French noblemen and others to offices of power and responsibility, in preference to English. He died in 1066 and Harold, a powerful noble man was placed on the throne. But William, Duke of Normandy—a cousin of the deceased king—asserted his claim to the throne and invaded England in the autumn of 1066. On the 14th of October, in the battle of Hastings, the fate of England was decided,—Harold defeated and killed, and the whole country passed into Norman hands.

With the Norman Conquest, as I have said, *English* began to be used by the ignorant and the poorer classes only. The higher and the more educated section of the people adopted the French language or the *Latin*. Pleadings in the law-courts were made in French; writings were done in *Latin* or in *French*. Thus, it was feared that England would be Frenchified, in no time. But, there was still some oil, which kept the lamp burning, though feebly.

Just as in the first century A.D., when the Romans invaded Britain, the higher classes readily adopted Roman custom, language etc. but the rude, the ignorant and the uncivilised portion of the population kept to their old beliefs and usages, so in the present case, though the higher classes took to the manners, and the language of the victors, the lower classes still clung to their native peculiarities. This is almost a law, universally true. It is owing to these rude inhabitants of England, that the language managed to live and lived to become what it is to-day—the most flourishing and widely-prevalent language in the world.

Thus, Anglo-Saxon ceased to be a language in fashion, after the Norman Conquest. *West-Saxon*

which had raised itself supreme over all the other dialects, as the result of the political supremacy of Wessex, fell to the level of the others. In other words, it degenerated into the position of a dialect, like the others. This state of things went on for three centuries. During this time, there being in no sense, a national tongue, a number of dialects were prevalent simultaneously in all England; every one of these had its own peculiarity, and was used by a particular people who had, to all intents and purposes, no political relation with the rest. There were three principal dialects,—the *Northern*, the *Midland*, and the *Southern*. The Midland dialect, as its name readily conveys to the mind was half-way between the two dialects used in the extremities—North and South. They had peculiarities distinct enough to enable one to distinguish one from the other.

The Northern dialect, which was the lineal descendant of *Old Northumbrian*, was prevalent in the regions bounded by the Humber on the north, the Firth or Forth on the south and the Penine Chain on the West; the Midland dialect, the descendant of the Mercian, occupied the central districts, bounded by the Humber and the Thames on the north and the south, respectively and the Penine on the east, this dialect further resolved into the East Midland dialect and the West Midland dialect, the former of which spread over a larger territory and was the more important of the two. The Southern dialect extended from the Thames to the Channel, and included portions of the western countries, north of the Thames. Each of these called itself the English speech, but did not grudge the others the title. The three dialects were quite different from one another—orthographically, lexically and grammatically. One radical distinction between the speeches of the two extreme regions was that the south was much more conservative of its grammatical inflections, than the North. But the influx of French words in the vocabulary of each, was about the same and occurred about the same time.

In 1244, a serious quarrel ensued between

the kings of England and France. The French King Louis IX summoned to Paris all noblemen who had possessions both in England and France and asked them to relinquish their property in either of the kingdoms. The manifest ground was that no one can be faithful to two sovereigns at one and the same time. When the England monarch heard of this, he at once issued orders of confiscation of all lands in England, belonging to Frenchmen, specially Normans. This led to an open rupture between the two countries and all communications between France and England were cut off.

The principal result of these political changes was that variations began to crop up between the French spoken in England and that spoken on the continent and consequently *Anglo-Norman French* was degraded from its hitherto supreme position.

This little spark was fanned by another circumstance, thus to bring up the blaze. The debasement of *Anglo-French* had already begun to bring the hitherto reduced English language into prominence. The creation of a respectable literature in the native tongue, served to raise *English* still more. In the latter half of the fourteenth century, a number of eminent writers, in the native tongue, appeared. *Travels* of the supposed Sir John Mandeville was a momentous work. Langland published his religious poem, *the Vision of William concerning Piers the Plowman*. About the same time Wycliffe translated the Bible into *English*, and Gower wrote his *Confessio Amantis*. But the writer, who did most to give *English* a stamp of gracefulness and efficiency and make it a worthy vehicle of thought was Geoffrey Chaucer, who, in his *Canterbury Tales*, gives us a complete picture of English life—vivid, true and wonderfully comprehensive. He wrote in the East Midland dialect which in consequence began to be universally used in literature. Chaucer's genius perceived the latent force which lay in the defunct native tongue, and roused it up with his immortal trumpet-note. It was not because Chaucer was ignorant of *French* or *Latin* or that he wanted

to be heard and appreciated by the "many-headed multitude",—"un-sad and ever vutrewē"—that he wrote in *English*, but because, as he thought, "the English language was the only one, in which Englishmen had any business to write". This bold and almost heroic step on Chaucer's part did most to raise the English language into its present eminence.

The following table will show, at a glance, the positions of the several languages belonging to the Teutonic Group, of which *English* is one :—

		Gothic (Mesogothic)	
Teutonic	East-Germanic	{ Scandinavian or Norse (Icelandic, Swedish, Danish,	
	West-Germanic	{ High German (old, Middle, New)	
		{ Low German Low Frankish; old Saxon; Frisian; <i>Saxon</i> or <i>English</i> .	

One word about the words, "English", "England". Of the three classes of Teutonic invaders, the Angles were the most numerous and covered the largest territory. So, when the Saxons and the Angles blended together, the name of the "Angles" was originally used to designate the country, and the language; *Englisc*, "English" was the title they enjoyed in common, both as to their race and their language. The name *Englaland* (hence England) i.e. 'the land of the Angles' was supplied afterwards to the country between the Firth of Forth and the English channel.

AJAX.



GREEN-MANURING

In my previous note on the College of Agriculture, Bengal, I had an occasion to mention incidentally that some good results were obtained from green-manuring in the Experimental Farm attached to this Institution. The object of the present article is to deal with the subject more elaborately with some facts and figures.

We all know that manure forms a most potent factor in agricultural economy and it is

also an established truth that improper or insufficient application of manures does not yield healthy crops. The first and foremost aim of every Agriculturist is the improvement of his own land so as to make it as much productive as possible and to attain this end he spares no pains to apply methods, local or foreign. The present scientific training involves, among many other important factors of agriculture, in the analysis of soils and determination of the values of manures in the respective plots.

Food-materials present in the soil become gradually exhausted owing to the growth of plants; and various materials in the shape of manures are applied to the soil to replace the exhausted substances.

A soil is said to be fertile when nearly all the food-materials are present in it in a readily available form to ensure the growth of crops. The chief elements required for the fertility of the soil are Nitrogen, Phosphorous, Potash and lime. Hence great attention is to be paid to replace these elements which may in time become deficient in the soil. To save the soil from too much exhaustion the system of Rotation of crops has been introduced in many parts of India. There are some plants which are quite exhausting and some which exercise an ameliorating influence on the soil. So by the rotation of these crops the fertility of a soil can be appreciably maintained. There is also another system which goes hand in hand with the rotation—the process of growing mixed crops. This also upholds the fertility of the soil to a great extent. Thus to keep the soil productive many methods are to be employed but manuring must be done when the soil becomes deficient in plant food.

It is not beyond our knowledge that many lands have been left barren owing to the fact that the cultivator becomes seriously handicapped for the difficulty of obtaining an adequate supply of manures.

Of the manures the most popular and almost universally employed is the farm-yard manure. Even this cannot be had in sufficient quantities in a poor country like ours where much of it is burnt away in the shape of cow-dung cakes as the ryots are unable to pay for other kinds of fuels. Where this manure is not available without a considerable amount of expense the system of "green-manuring" can be very wisely and judiciously recommended. A soil lacking in organic matter or humus responds well to this method. Previous experiments showed that certain kinds of plants could grow in soil poor in nitrogen and they could very satisfactorily thrive thereon without a bit of nitrogenous manuring. This led many Scientists of the day to carry their researches in this direction. Till at last it was discovered that when these plants

become a few weeks old there appear certain tubercles on the roots of the seedlings which increase in size and become globular and in these nodules there is a remarkable and unique group of organisms. In subsequent years it was found that all the sub-orders of Leguminosaceae (Papilionaceae, Caesalpinaceae, Mimosaceae) have these organisms growing on their root-nodules. Woronin was the first to observe these and he took them to be bacteria-like parasites growing on the roots. Afterward researches have classified them as the bacteria growing in the cells of the roots. Root-nodules without these bacteria do not exist and the fact that these bodies collect the nitrogen from the air and renovate the soil has been proved by the classical researches of Hellriegel and Wilfahrt. They investigated that a leguminous crop can grow on an unfertile land if a little soil which has grown the same crop in question is scattered on the land to enable the supply of the micro-organisms in the land. Further Beyerinck and Mazé cultured some of these bacteria to show that they are nitrogen collectors. On a decoction of leguminous plants he added $\frac{1}{2}$ p. c. asparagin and 2 p. c. sugar. On it the bacteria were found to thrive well. They no doubt first obtained nitrogen from the asparagin but after a few months of their growth the amount of nitrogen in the culture was considerably increased which must have come from the atmosphere. This fact settles the question without any further dispute that these bacteria growing on the nodules assimilate and fix the nitrogen from the air.

From all these researches it is quite evident that by growing the plants of the Natural order, Leguminosaceae, a soil can be enriched in its nitrogenous constituent. Such plants can therefore be grown in poor soils to replenish their exhausted nitrogen. When the plants attain considerable heights, a ladder should be passed above them and they should be ploughed under and incorporated with the soil. This enables the farmers to retain the amount of nitrogen collected by the bacteria as well as the carbonaceous material which it took from the air. Instead of letting the land lie fallow and thus making it a bed of weeds after the raising of *Bhadoi* Crops, it will pay much to grow leguminous plants on it. Before the *Rabi* sowings take place they will have attained a good height with heavy leaves and probably be beginning to flower when they can be ploughed down thoroughly, the land in this case will be better prepared for the next sowings, with a sufficient quantity of fertilising materials. In many farms government and private—this System has been found to be successful even where the farm yard manure fails. Reports have come from several places that even without sufficient irrigation a good outturn of vegetables can be expected by treating the land with this kind of manuring. The

following table, taken from the report of the Burdwan Farm will clearly show the importance of green-manuring from the point of economy :—

QUANTITY OF MANURE APPLIED PER ACRE	ACTUAL OUTTURN PER ACRE.				COST OF CULTIVATION PER ACRE.				Money value of outturn per acre.	Gain (+ or loss (—) per acre.
	Paddy.	Straw.	Paddy.	Straw.	Cost of manure per acre.	Cost of culti- vation.	Total			
Jute, ploughed in	266	379	1,862	2,653	Rs. A. P. 7 0 0	Rs. A. P. 24 6 3	Rs. A. P. 31 6 3	Rs. A. P. 54 14 6	Rs. A. P. +23 8 3	
Cowdung, 50 maunds.	188	284	1,316	1,988	1 12 0	28 8 9	30 4 9	39 2 6	+ 8 13 9	
Unmanured...	86	120	602	840	...	24 1 0	24 1 0	17 11 6	—6 5 6	
Sun hemp, ploughed in	166	240	1,162	1,680	7 3 6	23 10 0	30 13 6	33 9 3	+ 2 11 9	
Dhaincha, ploughed in	288	58	2,016	3,506	6 12 6	23 15 3	30 11 9	58 4 9	+ 27 9 0	

Among the crops used for green-manuring the following have been practised with immense success and they are well recommended for the purpose :—

Dhaincha (*Sesbania aculeata*)

Sunhemp (*crotolaria juncea*)

Jute (*corchorus capsulaus* and *Corchorus olitorius*)

Cow-pea (*Vigna catiang*)

Kulthi (*Dolichos bi-floratus*)

It is now strongly advised that farmers should adopt a systematic method of this manuring in their poor, low, light and sandy lands. Persons

interested in gardening will also find good results if they continue a regular practice of this method in their vegetable gardens.

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HISTORY AS A SUBJECT FOR STUDY.

II

(*Continued from Page 293*)

Education is incomplete without History. Patriotism must needs be based on the storied past if the history of the days gone by be glorious the very fact will give immense energy to our actions and even if the past be not characterised by flame images and brilliant epochs it will prove of immense value to emulate the more Civilised nations of the past ; in the same way as a man of an ordinary family but earnest and sincere finds it exceedingly encouraging to attempt for a good name for himself as an example for his progenitors. Family pride *i.e.* History of the family is the precursor of National pride and patriotism. We all know what our "Charans" of old accomplished by singing door to door the glories of the past. They made men out of women ; heroes out of cowards, patriots of traitors and soldiers of idlers. What Romance is to a lover, family affection to labourers, Fame to authors, Degree to the students, the National flag to the fighting soldiers, History is to a man. Every patriot is a Historian "The heart is strengthened and weakened by what it hears and sees and until it hears and sees the bad and the good it knows neither sorrow nor joy in this world."

In Politics and Economics History is indispensable. To get at the conception of the state we require the ladder to History. Fr. Stahl was not completely successful in Politics only on account of his want of thorough Historical education. The unparalleled Hannibal, the noble Tiberius, the stern Lycurgus, the good Solon, the pious Asoka, the mighty Pericles, the diplomatic Richelieu, the patriotic Maticine, the great Alfred,

the Princely Bismark all have made their exeunts from the world's stage. No more to appear yet have they not a word, a hint a caution, even a piece of advice for us ? Yes, they have. Concerning us the Indians an eminent author of Europe has said, 'India has produced saintly hermits, great philosophers, distinguished poets, brave warriors, excellent fathers and sons but has never produced truly great statesmen.' Quite otherwise would the Professor have said had we a sound connected History. It is History which has shown the state to be a very active factor of social progress, the abolition of Slavery, of Serfdom, of guilds and the enactment of Industrial laws in Europe.

In Economics and Logic historical is a distinct System of drawing inferences. In Philosophy it is no less important. "History" as is aptly said by Mr. Hydari the Financial Secretary to the Nizam's Government "is the expression of Divine intelligence and will as the record of an ever-moving onward march of progress gradually unfolding the Divine idea." The hand of God is always to be observed in the Eternal war between Truth and Falsehood, Virtue and Vice, Sincerity and Dupery. The great Contest has its Waterloos and Zamas, treaties of Utrecht and Westphalia, its Councils of Trent and the Courts at the Hagues : the true philosopher has always something to learn from them.

The question of life and death concerns us all. To the meditating Philosopher, the experimenting Scientist, the busy Statesman ; to the Hindu, the Christian, the Mahamedan and to the Pagan ; to the ascetic, the hermit and to the materialist, to all, this is 'the Question.' Ought we not to know then how to live and die for ourselves, for our family, for our country, king and nation ? In deed this is a question of vital importance. Are we to live like animals for ourselves only ? Are we to spend the brief space of time allotted to each of us in gluttony and self emolument only ? Nay there is a sterner and nobler motive than this. And where to learn all these ? In History is the answer. Let us look once towards Hannibal kneeling before the altar

of God, besides his father, swearing an eternal vengeance against the 'Eternal City.' There he marches out with his men, through the Pyrenees and the Alps to the Country sworn on. To obey the spirit of his dead Father he undertakes such a mighty task of crushing the huge Roman Empire. There we have Leonidas and his brave followers combing their long hair to meet the vast host to death. There the peasant maid of Domremy going to the field to maintain her king. There stands Wolfe sword in hand, weaker, weaker, and weaker sinking sinking and sinking to the grave "the path of Glory." Scorning the torture, winking at the inevitable Death, for his country, dear city and affectionate family, let us look once, on the beaming face of Regulus. The living images of deathless friendship, of patience, of valour, and courage all are recorded in the Eternal Book of Time. Harmodius, Junius Brutus, Protap Sinha, Akbar: there are innumerable others. History is the Eternal Treasury which Time took much pains to fill in with rubies, diamonds, gold, silver, copper and what not—a great chronicle emblazoned with characters of the noblest and the vilest: the Igdrasil of innumerable leaves, and a great variety theatre. What human heart is there that will not pity the hapless Queen of France, offer a whole hearted sympathy with the fate of the great Lion of the 19th century take fire at the patriotism of Maticine and weep at the fate of the great Carthaginian? Then comes the life that we are to avoid; such are those led by Ephialtes the Malian, Alcibiades, Mir Jafar and others. Models for our imitation fingerposts for the future are alike furnished by History.

As pastime and pleasant reading the claim of History ranks high if not the highest. Novels and Biographies are but histories—true or imaginary and who likes them not.

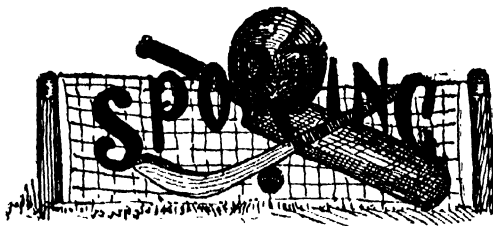
Every science is a history by itself and without History there cannot be any perfect Science. To Science itself it is as precious as heat and cold to a chemist, scalpel and microscope to a Botanist, the Symbols and numbers to a mathematician, the Compass and the fixed stars to the mariners.

Then again "the word of a Great man is a voice direct from Nature's own heart. Men must and do listen to that. To touch a greatman is to touch Heaven" to think of them is to think of God, to adore them is to have transcendent admiration of the Supreme Being. History records the lives and doings of the great and as such certainly deserves careful perusal to be kept before us as a sort of everybody guide. As a register of events it is valuable, as an aid it is invaluable. This day, tomorrow, this year, the next and this century will all be History in time. Present past and future are all alike bound to be matters of History. "The whole past" says Carlyle "is the possession of the present. In a different time and it is always some other side of our common Human nature that has been developing". The actual truth is the sum of the past and present. 'Was' 'is' and 'ought to be' are inseparable, should be studied simultaneously. And we may conclude by quoting

"Not in vain the nation-strivings,
Nor by chance the currents flow;
Error-mazed yet Truth directed
To one certain end they go."

—Ibn Al Farid

B. B. M.



ALL-INDIA HOCKEY TOURNAMENT. ALLAHABAD.

The semi-finals in the All-India Hockey Tournament were played off on the 25th January. The game of the day was between the N. W. Railway Volunteers and the Nainital Volunteers, the popular favourites. A few minutes after the

game had started the N. W. succeeded in securing a goal, the only one scored during the whole match. The railway men played a dashing game and continuously passed their opponents. The Nainital goal-keeper, Gabriel, was again to the fore in saving and prevented defeat by a larger score. The Nainital tried hard to equalise but the Railway backs played a strong defence and foiled all attempts to secure the net. A very exciting and fast game thus ended in a win for the N. W. Railway Volunteers by one goal to love. The second game in the semifinals was between the 2nd Berkshire Regiment and the 4th Worcester Regiment. The game was well contested and resulted in victory for the Worcesters by four goals to two.

The finals were played on the 28th and there was a draw on that day. The drawn game was played off on the 29th between the North Western Railway volunteers and the 4th Worcester Regiment before a large concourse of spectators. The Worcesters in the beginning pressed their opponents very hard and narrowly missed scoring several times. The Volunteers made two or three rushes at goal but failed to score. At half time neither side had scored. In the second half the Volunteers played a splendid game and after several fruitless attempts to secure the net succeeded in scoring the only goal of the match. Both leaders gave a display of first class hockey and the game throughout was well contested. The Cup was presented to the winners by Lady Knox, the N. W. R. thus securing the trophy for the second time. The winning team were also presented with a smaller cup which they will keep. The runners up were presented with medals.

CRICKET.

SENIOR HARRISSON SHIELD, CALCUTTA.

SEMI FINAL: St. Xavier's College vs. Medical College. This game in the semifinal round of the above Shield Tournament was continued on Friday the 2nd February 1912 on the Customs ground when the Medical boys had no difficulty in

beating the St. Xavier's boys by the big margin of six wickets and 27 runs.

Scores :—

St. Xavier's College.

1st Innings...	174
2nd Innings...	64
	—
Total	238

Medical College.

1st Innings	153
2nd Innings (4 wks.)	112
	—
	265

LANSDOWNE SHIELD, CALCUTTA.

FIRST ROUND :

(1) Presidency College vs. Bishop's College—

The two teams played on the Dalhousie ground on Friday the 2nd inst. when the game ended in a victory for the Bishop's College team by three wickets 4 runs.

Scores :—

Presidency College.

1st Innings	... 104
2nd Innings	... 44
	—
Total	... 148

Bishop's College.

1st Innings	... 76
2nd Innings (7 wks.)	76
	—
Total	152

(2) Medical College vs. Madras a College.

Medical (150 runs), Madrasa (60).

(3) Scottish Churches' College vs. Metropolitan College. Scottish Churches—97. Metropolitan—123.



THE RELATIONS OF SCHOOLS TO UNIVERSITIES.*

By DR. JAMES GOW.

In Germany, and, I believe, in every Continental country, the Universities have nothing whatever to do with the schools. It is true that in Germany a boy cannot proceed to a University unless he has passed an examination, but this examination is not either prescribed or conducted by the Universities, but is managed by the State. In England, on the other hand, the Universities prescribe and conduct their own Entrance Examinations, and are willing if invited, to come to the schools and conduct the examination there; and farther, of late years, the Universities have agreed to accept, with certain limitations, one another's Entrance Certificates. Thus the connexion of the Universities with the schools, though voluntary on both sides, is pretty close, and likely to become closer as it grows in convenience.

For my part, I feel, that a discussion of the relations between the Universities and the schools is likely to be confused, first, because some speakers will have in mind *ideal* relations of ideal Universities and ideal schools, while others will be thinking of the best possible relations between actual Universities and actual schools; secondly, because we have in England two types of Universities and two types of schools—what I may call the “boarding” type and the “day” type. Thus, both the idealists and the opportunists may be talking, each in their own way, of four different schemes of education, viz:—

Boarding School + Boarding University,

Day School + Day University,

Boarding School + Day University,

Day School + Boarding University,

and the relations between the Universities and the schools in each of these schemes need not be and perhaps ought not to be, the same. Obviously, it is more expedient for the Boarding University to have a general entrance examination closely connected with school work than it is for the Day University, which might have only an entrance examination for each faculty or none at all. And, again, to be examined by the Universities is obviously more convenient to the boarding school than to the day school.

If I tried to deal with these complexities, I should occupy far more than my fair share of your time. I men-

tion them only to show that I am aware of them and do not pretend that in what I have to say I am dealing with more than one small portion of the subject. I shall, in fact, confine myself entirely to the connexion of Oxford and Cambridge with the schools.

This connexion, it must be remembered, is of recent origin. In the sixties of the last century, the Cambridge “Little-go,” properly called “the Previous Examination,” could not be taken except by undergraduates in their fourth term of residence or later. In the early seventies it could be taken in the second term of residence, but not sooner. Meanwhile, the Head Masters’ Conference had been instituted, and this was, as it still is, a club of the head masters of those schools which send a considerable proportion of their boys to Oxford and Cambridge. The Conference was of opinion that Oxford “Smalls” and Cambridge “Little-go” were rather trivial examinations which might well be taken at school, and which, if deferred, were a serious interruption to better work. Representations to this effect were made, and, in November 1873, the Universities signed a concordat by which the Oxford and Cambridge Schools Examination Board was created. This Board was empowered to examine schools and to grant certificates exempting from the first examination in either University or both. The subsequent developments of this scheme need not detain us, but it may be well to mention that the Oxford and Cambridge Local Examinations, though considerably older than the examinations of the Joint Board, did not, until recently, confer any exemptions, and do not now confer any except at their own titular University.

This history points to some facts which are of importance to the present discussion. The connexion of the schools with Oxford and Cambridge was not accidental but deliberate, and was due to more than one cause. In the first place, the schools had immensely improved in general efficiency since the early years of the century. It would appear that even classics, at a time when little else was taught, were not taught very well at most schools; for more than once, in the days of Gladstone and Macaulay, Shrewsbury boys who were not yet in residence at the University came up and beat the elite of the undergraduates. No such thing has happened in living memory. The curriculum had evidently become much wider, and the teaching more strenuous, when head masters demanded that “Small” and the “Little-go” should be taken at school. The improvement was probably caused by these very examinations which, if I remember rightly, were not instituted till about 1830.

But the postponement of examinations became a grievance when head masters began to contemplate specialization of studies at school. So long as boys kept up their classics and mathematics, and French to the very

* This paper was read before a meeting of teachers, and appeared in *The Journal of Education* for January 1912.

end of their school course, it mattered little that they should be required to take an elementary examination in these subjects in a year's time. But when it was desired that a boy should drop at school such subjects as he was not likely to excel in, then the prospect of a distant examination in those subjects became disagreeable, and it seemed important that this examination should be got rid of early.

Thus the connexion of the schools with the Universities was caused in part by educational movements in the schools; but it was also caused by another movement which was not educational at all. The Public Schools Act of 1868, the Endowed Schools Act, and the Education Act of 1870 created a fear that all schools would soon be placed under State control, and the schools resorted to the Universities in order to protect themselves from the Education Office. It may be that this last motive was the most potent of the three that I have mentioned, but it is clear that all three were in operation and assisted to bring Universities and the schools together.

The connexion appears to me to offer some advantages which could hardly exist under another system. The Universities of Oxford and Cambridge, being boarding Universities and looking for their social opportunities, are probably right in requiring from all their students a certain minimum of common knowledge, such as every man should bring to an intellectual society. The choice of this minimum ought to be left to the conductors of the society. To deprive them of it by means of a State examination would, or might, make a great deal of difference to the value of University life.

It is true the Universities confine their choice to a very narrow curriculum, but they fix no age limits, they do not interfere with methods of teaching, and their examination is not regarded by the public as a "leaving examination." These are great merits from the point of view of the schools. Imagine, on the other hand, the effect of a State examination. It would no doubt allow a far larger choice of subjects and would do away with the host of professional examinations which now disturb the work of the schools. These are considerable advantages, but the examination would probably have an age limit and would be regarded as a leaving examination and the end of all learning. Furthermore, though the State would probably profess not to interfere with methods of teaching, I think it could hardly avoid doing so in fact. For the criticism of a State official is criticism which can be reinforced by very severe public penalties. For instance, the State now says to certain schools that they must teach Latin, and recommends a particular pronunciation of Latin. Other subjects are very likely to be treated in the same way, and the teacher will not, by resistance, imperil his grant or

expose his pupils to wholesale rejection. At present also, State does not seem to me nearly so successful as the Universities in maintaining a standard of attainment, but I dare say this is an accidental defect and could be remedied.

It will be easily guessed that my opinions proceed from the fact that I regard the teacher as an artist who, having a certain work to do, should be allowed to do it in his own way. No artist, so far as I know, objects to having his subject chosen for him. I never heard that a painter or a sculptor was indignant at being asked to paint or carve, say, an altar-piece of a given subject and of given dimensions; or that a musician, when asked for a symphony or overture, insisted that he ought to compose a quartette. On the contrary, I believe that every artist is stimulated by limitations of subject, size, and so forth—limitations of the end in view—but resists attempts to hamper his method. He will gladly do what is wanted if he is allowed to do it in his own way. Similarly, the good teacher, in my experience of him, does not complain of set subjects or set standards, if he is allowed to teach in the way that suits him best. I have, in former days, advocated uniformity of curriculum, and I should not object if the State established certain types of schools and required me to conform to one of them. But I should object very strongly to being told how to handle the several subjects of the curriculum, and I should wish the examination and inspection of my school to be undertaken by the Universities. They have an interest in making the schools as good as possible, but their criticism carries no penalties and is the criticism of fellow-craftsmen.

It seems to me essential to the welfare of our profession that there should be a lively free discussion of difficulties and a perpetual exercise of the intelligence in all grades. This freedom and initiative are secured in Germany by the fact that the Leaving Examination is conducted by the teachers under the superintendence of Inspectors who have themselves formerly been teachers. The nearest approach to this system that we are likely to get in England is to entrust examination and inspection to the Universities.

COMPULSORY EDUCATION FOR INDIA.

Sir,—A proposal has been put forward by the Hon. Mr. Gokhale for a widespread scheme for the education of the Indian people in which is included a compulsory clause. The speech made by the Lieutenant-Governor of Bengal at the St. Andrew's dinner held in Calcutta on November 30 ult. contained references which indicate that the Government of India have scheme under con-

consideration 'to multiply schools and extend primary education' though whether this scheme is to include Mr. Gokhale's compulsory proposal or not does not appear. As one of considerable experience not only in the residency towns but also in the interior, where the vast majority of the people live in small towns and villages, I cannot but consider the compulsory proposal as most ill-advised, especially at the present juncture. Our rule here, as has been truly pointed out, depends on the contentment of the Indian masses. Agitators have sought in vain to disturb that contentment, but if a compulsory clause is applied I foresee a cause of friction and discontent which will see the people unanimously against the Government. There will not be wanting the usual agitators to misrepresent the Government's intentions in the matter, and given the one fact that pressure is being brought to bear, all the misrepresentations of motives which will surely follow will readily be believed to the disturbance of the good relations which now exist between the real people and the Government.

An Indian village as a self-contained community which supplies itself with all its needs as understood by its inhabitants. What facilities for education they think they want they have already provided themselves with. All the classes that require to be literate, the *bunyas* (grocers,) the *mahajuns* (financiers), and, of course, such Brahmans as pursue a priestly career, have their schools, in which they learn what they want to learn. I do not think it will be found possible by compulsion to make them learn what they do not want to learn. Persuasion may answer, not compulsion. The Lieutenant-Governor, indeed, gave an apt illustration of the superiority in present needs of the education the people give themselves to that provided by our westernised schools and universities when in the same speech he referred to the ousting of the English educated Bengali Banias (financiers and bankers) of Calcutta by the indigenously educated Marwari financiers.

There is no doubt that in any scheme that the Government of India may now enter into they will be rendered wise enough by their experience in the past to infuse a practical and useful spirit, but all the good they may do will be destroyed if compulsion is exercised. The eager way in which certain classes, what we call the *bhadralogs*, or small gentry, seized upon the opportunity for higher education provided by Government should not mislead us. They thought there was money in it, and to a certain extent there was; but the same does not apply to the masses, who will not see it in the same light.

If compulsion is exercised serious discontent will surely follow. To give a mild example of how compulsion will be misrepresented, suppose the Government pass an Act similar to the English Act imposing fines on parents for not sending their children to school, and inflict imprisonment in case the fines are not paid, the agitators will raise an outcry that this is only another dodge to squeeze money unjustly and oppressively from the poor people. Compulsion exists in the matter of revenue, of course, but the case is different. However much the people dislike paying taxes, they know that taxes are just and necessary. But they will not understand the same in the matter of school fines. Multiply the obstinacy of the English parent in the early days of the School Board by a thousand times and you will have but a faint idea of the recalcitrancy which the Indian peasants, who form the vast majority of the Indian people, will display to compulsion.

I write now in the hope of publication because, though nothing definite is announced, we cannot tell what may be coming, since the compulsory proposal has been made by a man of Mr. Gokhale's standing, and if your influence can be enlisted it may avert trouble which is sure to appear if compulsion in this matter is exercised—Mr. C. A. Judge in the *Times*.

Pp. 92

NOTES ON

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BUSINESS NOTICES.

All communications intended for the Editor should be addressed "To the Editor" and not to any member of staff by name.

All communications of a business nature (advertisements, changes of address, enrolment as a subscriber) should be addressed to the Manager, and all remittances should be made payable to him.

NOTICE TO CORRESPONDENTS.

Correspondents are requested to write legibly on one side of the paper while sending in MSS. for the press.

Communications intended for publication must be accompanied by the name and address of the writer not necessarily for publication but only to satisfy the Editor.



Vol. 1 THE COLLEGIAN No. 10

An All-India Journal of Education.

CALCUTTA, THURSDAY 29TH FEBRUARY, 1912

We regret to record the death of the Maharaja of Maurbhanj (Orissa) The late Maharaja of Maurbhanj at the Maharaja's Calcutta Residence on Thursday morning the 22nd instant. The Maharaja was badly wounded at a recent "Shikar" and although some of the bullets were extracted after a successful operation by Drs. S. P. Subbadhikari and Nil Ratan Sarkar, some were not and in consideration of his weak health further operation was thought inadvisable. Blood poisoning set in which brought on the sad end.

The Maharaja was a man who took a deep interest in his State. He was an Indian Rajah of the new type. He was located at the Calcutta Presidency College. The State was on its way of becoming an industrial State of considerable importance. He visited Europe and America last year. His iron ores were secured for the Kalimati works.

* * *

It is gratifying to note that Miss Nirmalabala Nayak of the Calcutta Bethune College has been awarded the Ramtanu Lahiri gold medal on the result of the B. A. Examination of 1911. She is the first lady graduate from Orissa.

* * *

A meeting in support of the fund of £250,000 which is being raised for the education of Europeans and Eurasians in India was held, by the invitation of Mrs. Scharlieb, at 149 Harley Street, W., London, on the 30th January.

Bishop Boyd Carpenter, who

presided, attributed the unfortunate position which the Eurasian, or, as he was now called, Anglo-Indian, held to-day to the fact that he was just enough unlike ourselves to provoke contempt. Whatever might be the story of their descent, however, unwise such mixtures might be physiologically, the people were there and numbered about a quarter of a million. As a ruling people we had no right to neglect them. Some people were very fond of talking about the superiority of blood and race, and the old idea of an Englishman's being worth three Frenchmen persisted, but the theory at the bottom of that was mistaken. The greatness of a people depended upon ideas which had been accepted and become ideals. The Anglo-Indians would express pride in their European blood, but unfortunately these ideas remained phantasms of the imagination. They wanted of give these people in their education such a conception of the ideals that had governed British life that these ideals would become part and parcel of their character.

* * *

Lecturing before the East India Association, London, on the 19th inst. Mr. S. S. Thorburn, ex-Financial Commissioner for the Punjab urged that in the diffusion of education preference should be given to agriculturists seeing how long their interests had been subordinated to those of the urban population. As the Bill stood, he said the rural population would have to bear most of the cost of Mr. Gokhale's proposals for compulsory education.

Local option should only be granted if 90 per cent. of the total cost were borne by localities electing for compulsion. Mr. Thorburn advocated a system of peasant scholarships.

Lord Reay, presiding said there were growing indications of the growth of unity of educated Hindus and Mahamedans on this subject. It would be wisest to proceed tentatively and experimentally, for if they proceeded on abstract and too general lines, they might create reaction of the dislike of education by the Indian people.

Indian
Science
Association
Calcutta

Dr. D. N. Mallik, D. Sc.,
F. R. S. E. delivered a lecture on
"The Magnetic Rotation of
Electric Discharge" on Thursday

the 15th February 1912 at 5-30 P.M. The Hon'ble Justice Sir Ashutosh Mookerjee kt. Saraswati C.S.I, M.A., D. L., D.Sc., F.R.A.S., F.R.S.E., Vice-President of the Association presided.

* * *

The number of girls receiving higher education and wishing to enter on a collegiate course in Bombay seems to be steadily increasing. More than a year ago, Mr. Conventon, Principal of the Elphinstone College, in a report to the Director of Public Instruction, dwelt on the need for the establishment of a separate College for ladies, in view of the increasing number of girl students seeking admission into Colleges. It must be obvious that a College for the exclusive benefit of lady students will possess advantages not to be had in institutions meant specially for boys. In the existing colleges, the lady-students cannot participate in the sports and recreations open to the male students. These are serious drawbacks which deserve to be remedied without delay. The wealthy men and the merchant princes of Bombay cannot better invest their money than in founding a College for the exclusive benefit of their sisters and daughters.

* * *

An Extraordinary Meeting of the Literary Section was held on Saturday, the 10th instant, at 6-30 p.m. when Professor S. C. Mahalanobis, B.Sc. (EDIN), F.R.S.E., of the Presidency College delivered a *Lantern* lecture on "the Citadel of life."

SITUATION VACANT

WANTED immediately for the Sri Partap College, Srinagar, Kashmir, a Professor of English and a Professor of Mathematics, with high qualifications and competent to teach up to B. A. classes. Salary Rs. 200-25-250.

Applications stating age, with attested copies of testimonials (which will not be returned) should be submitted to the Minister of Education Jammu and Kashmir State, Jammu, not later than 15th March 1912.

Selected candidates only will receive reply.

By order
R. P. Pande, Secretary
to Minister of Education Jammu and
Kashmir State.



CALCUTTA UNIVERSITY

On the motion of Sir Ashutosh Mookerjee, the Syndicate of the Calcutta University has resolved to recommend to the Senate that in commemoration of the Imperial visit, Honorary Degrees be conferred upon the following gentlemen, each of whom, by reason of his eminent position and attainments is a fit and proper person to receive such degree: Doctor of Philosophy, Lt.-Col. D. C. Phillott; Doctor of Science, Prof. J. C. Bose and Prof. P. J. Bruhl.

The Syndicate has also resolved to recommend to the Senate also in commemoration of the Imperial visit, the founding of two professor-ships, one for Indian History and Antiquities and the other for Mathematics. The former is to be designated the Regius Professorship of Indian History and Antiquities and the second the Hardinge Professorship of Mathematics. The salary of each Professor is fixed at Rs. 12,000 a year and the first incumbent of each chair is to hold office for a term of five years.

Prof. D. N. Mallick, has been appointed University Reader in Physics to deliver a course of lectures on Optical Theories.

MADRAS UNIVERSITY

The Syndicate recommends - that the Hon'ble Dr. A. G. Bourne, C. I. E., an Ex-officio Fellow, and the recently appointed Ordinary Fellows be assigned to the Faculties as under:-
Faculty of Arts:- 1. The Hon'ble Dr. A. G. Bourne, C. I. E., F.R.S. 2. Hon'ble Mr. J. H. Stone, M. A., F. R. H. S. 3. Hon'ble Dewan Bahadur V. Ramabhadra Naidu. 4. The Rev. Canon Sell, D. D. 5. Rao Bahadur C. Nagoji Rau, B. A. 6. Rao Bahadur K. Ramanujachariyar, M. A. B. L. 7. Mr. K. B. Ramanathan M. A. B. L. 8. Mr. S. Vencobachari B. A. 9. P. T. Srinivasa Aiyangar, M. A. 10. Mr. P. F. Fyson, B. A., F. L. S. 11. Rao Bahadur R. Venkataratnam Naidu, M. A. 12. Mr. K. Ramanujachariar. B. A. Faculty of Law:- 1. The Hon'ble Mr. P. S. Sivaswami Aiyar, C. I. E., B. A. B. L. 2. Mr. S. Srinivasa Aiyangar, B. A. B. L. 3. Mr.

C. P. Ramaswami Aiyar, B.A. B. L. Faculty of Medicine:-Mr. H. Rangappa, B. A. M. B. & C. M. Faculty of Engineering-Mr. W. H. James, B. Sc.

The Syndicate recommends-That the Senate accept the offer to the University of an endowment of Rs. 7,200 made by the late Hon'ble Mr. Sir Subramanya V. Krishnaswami Aiyar for the establishment of a University Lectureship of the annual value of Rs. 250 to be known as the 'Sir Subramanya Aiyar Lectureship'; and that the terms and conditions of the lectureship be as follows- (1) The lecture shall be on any topic connected with Physical or Natural Science or the Ancient History and Archaeology of India. (2) The Lecturer shall be selected every year not less than three months before the date of the lecture by the Syndicate of the Madras University from amongst the graduates of the University. (3) The lecture shall be delivered at a suitable place fixed by the Syndicate and shall be open to students of the University, graduates of the University and the general public. (4) The University may print and publish the lecture and, in case it does not choose to do so shall give the Lecturer full liberty to publish it.

The following is the list of candidates who qualified for the Degree of Licentiate in Teaching under the

Licentiate	Old Regulations in the year 1912:-
Teaching	First Class: Mrityunjayadu, Ivaturi.
Exam. results	(Private study.) Second Class: Abraham, Jesudasan (Teachers' College, Saidapet and Private study.) Devaraja Aiyar, K. V. (Training College, Rajahmundry and Private study.) Krishnamachari, Saidapet (Private study.) Lakshmana Bhatji, Kasargod (Training College, Rajahmundry and Private study.) Martyn, Joseph Samuel (Private study.) Ramanuja Aiyangar, Chakravarti (Private study.) Srinivasa Aiyangar, Adur (Private study.) Subrahmanyam, P. S. (Training College, Rajahmundry and Private study.) Suryanarayana, Malapaka (Training College, Rajahmundry and Private study)

BOMBAY UNIVERSITY.

His Excellency the Governor as Chancellor presided at the Convocation of the Bombay University for conferring degrees. In addressing the graduates he said:-'Among other things my views of life are deeply tinged by my inheritance of western thought, while yours already take their complexion from eastern customs, religions and environment. That is no bar between us. It does not in the least diminish the warm interest that I feel in your welfare. It need not cause you to doubt my friendship or to feel that I cannot enter into your ideas and aspirations. The difference between east and west is capable of exaggeration.' After referring to the India of the past, the Chancellor said that Bombay was fortunate as regards the provision of training directed to the fulfilment of the industrial, commercial and economic needs of India. He then spoke at length

Annual Convocation 20th Febry 1912

on the responsibilities of graduates and asked them to look for what was good. 'His Majesty, our beloved King-Emperor, at Calcutta said, "I give to India the watchword of hope. On every side I trace signs and stirrings of a new life." For this hope there are abundant reasons, and it must be that in the increase of organized activities the process of nation building will surely advance. The national ideal is wholly foreign to India. It has been planted on eastern soil as one of the results of the dissemination of western learning and the assimilation of western thought which the universities of India have promoted. It is a high aspiration, which I hope you, young men, well cherish. There is not one of you who cannot do something towards its realization by setting an example of a spirit of brotherhood, by acting not as members of communities and castes but as citizens of India and by putting the general good foremost in your aims. But remember always that it is to the British rule that you owe the idea of common nation-hood, the stirrings of new life to which his Majesty referred and the possibilities of gradually welding your diverse peoples into an Indian nation fit for self-government.'

This was followed by a long address from Sir N. G. Chandravarkar, Vice-Chancellor, who referred to the changes introduced in the system and curricula of examinations. He asked the graduates to be true to their *Alma Mater*. In conclusion he said:—'Our King Emperor George the Fifth has given us his vision and his illumination knitting afresh the bonds of the empire. To live true to it by cultivating this gift of Avatar this capacity of sympathy and broad spirit, rising above the narrowness of cast and sect and position, to meet the commercial, industrial and money-making spirit of the age by the higher spirit of love and service, is the one duty that marks culture; and without it all education, and particularly university training, is a mere snare and a delusion. The times are rich in spite of much that seems troublous and depressing. The British Crown has shone afresh on us. Our sovereign has given us the stirring of a new life!'

EXAMINATION FOR THE DEGREE OF BACHELOR OF COMMERCE (B Com).

5. No Undergraduate will be admitted to this Examination, unless after passing the Intermediate Examination in Commerce at this University, he shall have kept four terms at a College or Institution recognized in Commerce, and unless he produce satisfactory testimonials under Form.

6. Candidates for the Degree of Bachelor of Commerce will be examined following subjects:—

- I. English.
- II. Economic History.
- III. Economic Geography.
- IV. Banking Law and Practice.
- V. Organisation of Industry and Commerce.
- VI. One of the following Voluntary subjects:—
 - (a) Exchanges, Investment and Currency.
 - (b) Accountancy and Auditing.
 - (c) Actuarial Science with Relative Mathematics.

I. ENGLISH—One Paper.

English Composition, including Precs-writing, and drafting Commercial Letters, Reports, Circulars, etc.

II. ECONOMIC HISTORY—One Paper.

Text-Books recommended:—

- Outlines of English Industrial History, by W. Cunningham and Ellen McArthur.
- British Commerce and Colonies, by H. De B. Gibbins.
- History of Commerce in Europe, by H. De B. Gibbins.

III. ECONOMIC GEOGRAPHY.—One Paper and a Practical Examination

The main factors connected with climate and soil affecting the production of articles of commerce. The cereals of different climates and their Zones; plants yielding starch, spices, condiments, sugar, etc.; Fruits and nuts; Medicinal plants; Textile plants; Building and furniture woods; Gums and resins; Economic Animal Products. The Economic Minerals, facilities for or obstacles to their profitable working.

Commercial towns and the causes of their greatness; colonial enterprise and the necessity therefrom; important markets for the chief commodities. Manufactures and the economic distribution of power; distribution of population; centralisation in manufacturing industries; shifting of trade centres, vicissitudes of commerce, competition. Consuls, Chambers of Commerce, commercial museums, and other means by which nations endeavour to promote their own commerce and industry. How natural advantages may be affected by the action of Governments. Trade routes, means of communication and transport in various countries. The effects on commerce of the construction of Canals, Railways, and Tunnels.

Practical Examination:—Candidates will be required to identify the chief Indian raw materials of commerce.

*Text-Books recommended:—*The Natural History of the raw materials of Commerce, by John Yeats. Hand-book of commercial Geography, by G. G. Chisholm. Applied Geography by J. Scott Keltie.

IV. BANKING LAW and PRACTICE—One Paper.

The relations between banker and customer; the banker's position in relation to infant customers, Joint Accounts, Partnership Accounts, and Accounts in the names of Corporations, Executors, and Trustees; Appropriation of Payments; Deposit Accounts, and Deposit Receipts; Crossed Cheques; Valid and Invalid Endorsements; Banker's position in relation to payment of customers' acceptances and collection of customers' Bills; Banker's Securities for Advances; Banker's lien; Legal and Equitable Mortgage; Bailment; Deposits for Safe Custody.

Co-operation and Profit Sharing; Co-operative Stores and Agricultural Societies; Co-operative Supply, Production and Sale. Co-operative Banks with limited and unlimited liability; Co-operative Saving Banks; Co-operative Banks as borrowers.

*Text-Book recommended:—*A Treatise on Banking Law, by J. D. Walker. Banking Law, by R. W. Holland and A. Nixon. Co-operation, by C. R. Fay. Co-operative Banking by H. W. Wolff.

*For consultation:—*Questions on Banking practice by the Institute of Bankers.

V. ORGANISATION OF INDUSTRY AND COMMERCE— One Paper.

Nature and Constitution of Business Houses; Partnerships: public and private Companies; Financing of new business; Organisation of Control and responsibility; Organisation of credit; Inquiring Agencies; Bank and Business References; Value and Business References; Value and Methods of Statistical Investigation.

The organisation of markets and the interdependence of markets and industrial phenomena. Produce markets and markets for manufactures. Industrial combinations and regulation of output; Factory Legislation. The concentration of specialized industries; Production on a large scale; localized industries.

The Rise and Progress of the Cotton Industry in England, India, the United States, and Japan; present conditions and prospects.

Foreign Trade; International Trade; Balance of Trade; the Organisation of Commercial Intelligence; Tariff Policies; Efficiency of Marketing; Railways and other agencies of Transport.

Text-Books recommended:—Business Organisation, by L. R. Dicksee. Imperial Organisation of Trade, by G. Drage. State in its relation to Trade, by Farrer and Giffon. State in its relation to Labour, by W. S. Jevons. Cotton Industry and Trade, by S. J. Chapman. Economic Transition in India, by Theodore Morison. Railways and the Nation, by W. Bolland.

VI. VOLUNTARY SUBJECTS.

VI (a) EXCHANGES, INVESTMENTS AND CURRENCY.

(Two Papers.)

(1) The Mechanism of Banking; Banking Capital; Banks of Deposit, Issue, Discount, and Remittance; Savings Banks; the general administration of a Bank and its administration during seasons of pressure; Clearing Houses; Bank Book-keeping; Regulation of the Issue of Notes; History of the Rise and Progress of the Banks of England, Scotland, Ireland, and India; Modern Banking Developments; Branch Banks; Bank Amalgamations; History of the Bank of England, and the Bank Charter Act; the banking systems of the leading foreign countries and of the British Colonies; Financial Crises.

(2) Mint Par and Course of Exchange. Specie Points Favourable and Unfavourable Exchange, Rise and Fall of the Exchange. Quotations in foreign and Home Currencies, Long and Short Exchange; London, Paris, Berlin, and New York Exchange; Silver Exchanges; Bullion Operations.

(3) The principles governing investments; the Money Market; the Short Loan Fund; Bill Brokers and Discount Houses; the Bank Rate; the Market Rate; the Deposit Rate; the Banker's Call Rate; Analysing and Appraising the Weekly Returns of the Bank of England and of the Indian Presidency Banks, and Bank Balance Sheets. Banking Reserve and its relation to the Money Market.

(4) Functions and Attributes of Money; Standard and Token Money; Legal Tender; Gresham's Law; Convertible and Inconvertible Paper Money; Gold and Silver discoveries and their effects on the relative values of these metals and on general prices; Interaction between Gold and Silver prices; Currency Theories; Indian Currency; Development of Credit Money.

Text-Books recommended.

Theory and Practice of Banking by H. D. Macleod (2 vols.).

Gilbart on Banking (2 vols.).

Presidency Banks Acts.

A Money Market Primer, by George Clare.

A. B. C. of Foreign Exchanges, by George Clare.

Foreign Exchanges, by G. J. Goschen.

VI (b) ACCOUNTANCY AND AUDITING.—Two Papers.

The accounts of different kinds of business including Bankers, Insurance Companies, Factories, Mining Companies, Railways, and Hotels, Charitable Institutions and other non trading concerns, Income and Expenditure Accounts, Branch Accounts, Cost Accounts, Bankruptcy Accounts, Departmental Accounts, Depreciation, Reserves, Sinking Funds; The Double Account System; Columnar Book-keeping.

Auditing; the continuous and the completed audit; the Detection of Fraud; Technical Errors, and Errors of Principle; First and Subsequent Audit; Verifying Cash, Securities, Stock sheets, Wages Sheets. Special considerations in different classes of audit; Valuation of Fixed and Floating Assets; Forms of Accounts and Balance sheets. Capital and Revenue Items; the Auditor's Certificate; the Liabilities of Investigations and the Certifying of Average Profits.

Text-Books recommended:—

Book-keeping for Company Secretaries, by L. R. Dicksee.

Advanced Accounting, by L. R. Dicksee.

Book-keeping and Accounts, by Spicer and Pegler.

Auditing, by L. R. Dicksee

VI (c) ACTUARIAL SCIENCE WITH RELATIVE

MATHEMATICS.—Two Papers.

(1) The Binomial and Exponential Theorems; the use of Logarithms, the Elements of the Theory of Probabilities, the Elements of the Calculus of Finite Differences including Interpolation and Summation; Elementary Differential and Integral Calculus *excluding questions requiring the use of Trigonometry*.

(2) Interest and Annuities Certain; Problems in Compound Interest; Equation of Payments; Valuation of Perpetuities, Varying Annuities and Increasing Annuity; Repayment of Loans by Annuity; Operation of sinking Funds; Valuation of Redeemable Securities; Loans repayable by Cumulative Sinking Funds; Capital Redemption Assurances; Calculation of Single and Annual Premiums; Policy Values; Applications of the Calculus of Finite Differences and the Infinitesimal Calculus for ascertaining the amount and present value of an annuity.

(3) Life Assurance Practice; Different kinds of Policies of Assurance and Annuities; Policy Conditions; Interpreting the Revenue Account and the Balance Sheet of a Life Assurance Company; Sources of Profit; Bonuses; Surrenders and Dividends; Valuation Returns; Proving a claim; Life Assurance as an Investment; Life Assurance Accounts.

Text Books recommended:—

Part I of the Institute of Actuaries Text-Book, by R. Todhunter.

Life Assurance Explained, by William Schooling.

GOVERNMENT NOTIFICATIONS AND ORDERS.

EDUCATIONAL PROGRESS IN INDIA. AN INCREASE OF A MILLION SCHOLARS IN FIVE YEARS.

A statistical statement is published in the "Gazette of India" showing the educational progress made in India and in the several provinces during the years 1906-07 to 1910-11. The principal figures for all India are as follows :—

	Population.	Total Scholars.	Total Expenditure.*
1906-07	241,264,968	5,388,632	5,59,04
1907-08	242,619,633	5,699,146	6,01,59
1908-09	242,820,305	5,972,204	6,58,48
1909-10	241,717,588	6,203,305	6,86,76
1910-11	254,820,616	6,345,582	7,12,68

* In Thousands of Rupees.

		Male Scholars.	Female Scholars.
1906-07	...	4,183,041	561,439
1907-08	...	4,428,175	617,786
1908-09	...	4,650,134	720,342
1909-10	...	4,826,554	763,580
1910-11	...	4,930,084	793,646

The principal figures for Bengal and Eastern Bengal and Assam are as follows :—

BENGAL.

	Popula- tion.	Total Scholars.	Expen- diture.*
1906-07	54,662,529	1,215,014	1,16,63
1907-08	53,771,914	1,288,541	1,25,56
1908-09	53,772,586	1,368,280	1,44,58
1909-10	52,669,869	1,422,419	1,50,89
1910-11	55,023,340	1,463,828	1,60,71

* In Thousands of Rupees.

E. B. AND ASSAM.

	Popula- tion.	Total Scholars.	Expen- diture.*
1906-07	... 30,788,134	815,519	51,24
1907-08	No change	880,631	58,29
1908-09	No change	953,123	66,34
1909-10	No change	954,883	65,94
1910-11	... 34,594,362	9,84,213	73,05

In Madras Presidency, the number of primary schools for males was 23,426, and 900 for females in 1910-11. The total number of scholars, both male and female, in all institutions was 1,215,725. The total expenditure was Rs. 1,27,61,000 in 1910-11 against 97,64,000 in 1906-7.

In Bombay Presidency, the number of public institutions for males were 11,267, and for females 1,121 in 1910-11, and the total number of scholars,

both male and female, in all institutions were 868,547 in 1910-11 against 720,547 in 1906-7. The total expenditure was Rs. 1,24,00,000 against Rs. 1,06,43,000 in 1906-7.

In the United Provinces the number of primary schools was 9,067 in 1910-11, against 9,545 in 1907. The total number of scholars, both male and female, in all institutions was 645,717 in 1910-11, against 606,174 in 1906-07. The total expenditure was Rs. 93,39,000 in 1910-11, against Rs. 74,93,000 in 1906-07.

In the Punjab the number of primary schools was 3,321 in 1910-11; the total number of scholars both male and female in all institutions was 346,240; and the total expenditure was Rs. 60,57,000 in 1910-11, against Rs. 51,97,000 in 1906-07.

In Burma the number of primary schools was 4,895 in 1910-11, against 4,950 in 1906-07. The total number of scholars in all institutions for male and female was 429,992 in 1910-11, against 398,598; and the total expenditure was Rs. 43,63,000 in 1910-11, against Rs. 34,87,000 in 1906-07.

In the Central Provinces and Berar the number of primary schools was 3,094 in 1910-11; the number of scholars both male and female in all institutions was 297,620; and the total expenditure was Rs. 30,85,000 in 1910-11, against Rs. 22,48,000 in 1906-07.

In the North-Western Frontier Provinces the number of primary schools was 264 in 1910-11, and the total number of scholars both male and female in all institutions was 31,891 in 1910-11, against 4,865 in 1906-07. The total expenditure was Rs. 3,88,000 in 1910-11, against Rs. 2,38,000 in 1906-07.

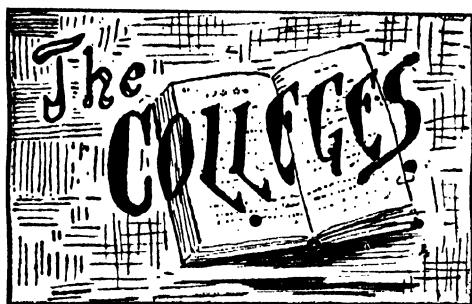
In Coorg the number of primary schools was 81 in 1910-11, and the total number of scholars both male and female in all institutions was 6,640 in 1910-11, against 4,865 in 1906-07. The total expenditure was Rs. 92,000 in 1910-11, against Rs. 49,000 in 1906-07.

Details are also published regarding the number of high schools and arts colleges and public institutions for males and females in all the provinces.

TUITION FEES IN THE PUNJAB.

LAHORE—FEBRUARY 16th.

The Director of Public Instruction has published a notification in the last "Punjab Gazette" enhancing the tuition fees of the several classes of the Government College. It is believed this will be not without its effect on private colleges that receive Government aid which is given on condition that their fees shall not be less than seventy-five per cent of those of the Government Colleges.



and Schools.

The 5th meeting of the Biological Society was held on Wednesday the 14th inst. at 4 P.M. under the presidency of Prof. S. C. Mahalanabis. Mr. Nibaran Chandra Bhattacharyya M. A., B. Sc. read a paper on "The influence of Muscular work and Respiration on Digestion."

The foundation day celebration of the Serampore College took place on Saturday the 17th instant. At 8 a.m. the students and the members of the staff assembled in the central hall, where a thanks giving ceremony was held. At 10-30 a.m., the athletic sports commenced and continued till 2-30 p. m., when Mr. A. K. Jameson distributed the prizes amongst the successful competitors. In the afternoon a meeting was held under the presidency of the Rev. W. Carey, when Professor J. R. Banerjee delivered a lecture on "Carey's Educational Ideal." A public meeting was held in the evening at the College Central hall, Sir Asutosh Mookerjee, Vice-Chancellor of Calcutta University, presided. Among those present were Professor Watt of the Scottish Churches College, Professor Banerjee, Rev. Mr. Gee, Principal of Bishop's College, Rev. Carey, Rev. H. Bridges, Rev. W. Woollard, Miss Dyson, Lady Principal of the United Training College, Calcutta, Mr. Dixon, and others. There was also a large number of missionaries who had come from various parts of the Province to attend the Baptist Mission Society's Conference in Calcutta.

The proceedings commenced with the presentation of the College report by the Rev. W. Sutton Page, Officiating Principal.

Sir Asutosh Mookerjee then delivered an interesting speech in the course of which he said that so far as he could gather from the records at his disposal, the College was in a flourishing condition till it was affiliated to the local University in 1857. Since then it had languished till it was revived a few years ago. There was a bright future for English education in this country, but the future

could be assured only if they had Colleges of the type of the Serampore College where they found the professors and pupils meeting together in closest intimacy and co-operation. The future of education in this country depended upon the foundation and maintenance of residential colleges, and they were extremely grateful that the Missionary Society at this juncture had considered it desirable to revive this college not only in its theological but in its secular departments. Sir Asutosh, in conclusion, congratulated the Principal and the staff of the College on the success that had attended their efforts, and assured them that if ever he could be of any assistance to them, his services would be ungrudgingly placed at their disposal. (Cheers.)

Prizes consisting of books were then distributed by Mrs. Gee to the successful students.

The Rev. R. Gee delivered an address to the students, after which, with a vote of thanks to the Chairman, and to the Rev. Mr. and Mrs. Gee, the proceedings were brought to a close.

The fourth ordinary meeting of the "Hindu students' moral and religious society" was held on the 11th February, Sunday, at the Hindu Hostel. This Society has for its object the inculcating moral and religious principles into the minds of the Hindu students. An attempt is made to familiarise the students with lofty ideals and teachings of the Hindu Scriptures. The students evince great interest in these meetings and they listen with undivided attention to the sermon and join the prayer devoutly. The Society is in the experimental state now; but for the great interest evinced by the professors and students alike, it is evident that it may have a useful career before it. It would be worth while to try such experiments in all Hindu, Moslem and Christian Hostels and thus try to free our educational institutions from the blame of imparting a godless education.

On the 11th of February there was a large gathering of the students of Bankipur in the B. N. College Hall. The Hon'ble Mr. S. Sinha, one of the foremost publicists of our province and the talented Editor of the "Hindustan Review" gave an interesting and instructive lecture to the students, advising them to take a vow never to smoke and drink. He exhorted his audience not to ape the fashions of the west but rather to follow the good ideals of the Europeans—their honesty of purpose, their devotion to principles, their punctuality, single-hearted love for one distinct aim of life, and, above all, their sense of self-sacrifice. He asked the students to take to physical exercise and to read books and periodicals, outside their University curricula. After a vote of thanks to the speaker and the chairman, who was no other than our stalwart Councilor the Hon'ble

Mr. M. Haque, proposed by Professor Shiveshwar Dayal M. A. the meeting was dissolved.

The College is providing for the Science laboratories' gas fittings at a cost of over 5 thousand.

Machinery have already come from Madras and work has been begun. A gas house is specially built near the laboratory and it is hoped that everything would be in working order within three weeks.

Mr. K. T. Bhusanamier a first class science lecturer of the College goes as senior Lecturer in Science to Zamorin's College, Calicut. We are sorry to lose him ; at the same time wish him every success he deserves. We are sure that he would win the golden opinion of all wherever he goes.

On 23rd January 1912 under the auspices of the games Association Prof. Ramamooriti

Naidu, the Indian Hercules, delivered an excellent lecture in Telugu in the Diamond Jubilee Town Hall on "Physical Culture," our Principal Mr. K. Ganapati Iyer Avergal, B. A., L. T., F. M. U., presided. The object of his lecture was to show that the Indian system of exercise is most perfectly suited to Indian constitutions, and that it has its advantages over other systems such as the Sandow and Juijitsu or Japanese systems. He also said throughout his lecture that intellectual, moral and physical culture go hand in hand and are closely connected with one another.

The Managing Committee of the D. A. V. College, Lahore, have unanimously appointed Lala Sain Das, M. A., Calcutta B. Sc., Cantab. as Principal in succession to Lala Hans Raj. Lala Sain Das is one of the brilliant set of men who after graduating from the College have been serving on the staff for only Rs. 75 per mensem as subsistence allowance.

The Inspection Committee of the Punjab University consisting of three members have recommended the disaffiliation of the science department of the Hindu College, Delhi. One member has dissented. It is admitted in the report of the committee that the

new board of trustees are endeavouring to improve the affairs of the college and that within a short period they have succeeded in raising funds and strengthening the staff. A local paper says that if the University intends giving any encouragement to the College this recommendation of the committee should be held in abeyance for at least six months.

In this celebration II. V. Lovett Esq. I.C.S. Commissioner Lucknow presided. The programme consisted of the following items ;—1. Anthem... "I will lift up mine eyes." 2. Invocation. The Rev. Bishop F. W. Warne. D. D. 3. Essay... Miss Wilhelmina V. Singh. (The Social position of Women in Vedic Times Compared with that of Women under the Caesars). 4. Drill. 5. Discussion „Miss Esther Ahmad Shah, Miss Gertrude Maya Das—Is the Study of the Indian Classics of more Value to the Indian Student than the Study of English Literature and Science? 6. Persian song, Students of the Persian department. 7. The Report, of Miss Robinson, the Principal, told of the new hostel to accommodate 200 women students and the progress of the year, work. 8. President's Address. 9. Presentation of Bilgrami prizes. 10. Chorus "Spinning Song" Wagner. 11. The Tree-planting. Address to the juniors and freshmen. Miss Iris O. M. Harris. Response—Miss Rachel D'Souza. Tree Song.

The Eighth Annual Oratorical and Declamation contest was held in Crawford Hall, Jumna Mission, on the 15th February 1912, at 6-15 P.M. The Committee of Judges, was composed of Sir George Knox LL. D of the High Court, Rev. Johnson and Dr. A. N. Ewing. Declamation Programme : Mr. Ram Chandra Rao, (First Year Class) Anthony's Funeral Oration. Mr. S. M. Mahmood, (Second Year) Industrial Development. Mr. Brahma Singh, (First Year) The Saving of Rebecah by Ivanhoe. Mr. N. K. Mukerji, (Second Year) The Death of Garfield.

Oration Programme. Mr. G. Chatterji, (Third Year) Social Service. Mr. B. N. Basu Mullick, (Fourth Year) Co-operation, Mr. Samuel Andrews, (Fourth Year) The Old Order Changeth giving place to New. Mr. Ram Nama Prasad, (Third Year) The Secret of success. The Decision of the Judges was in the declamations 1st Place N. K. Mukerji, and 2nd place S. M. Mahmood ; In the orations 1st place B. N. Basu Mullick and 2nd place S. P. Andrews.

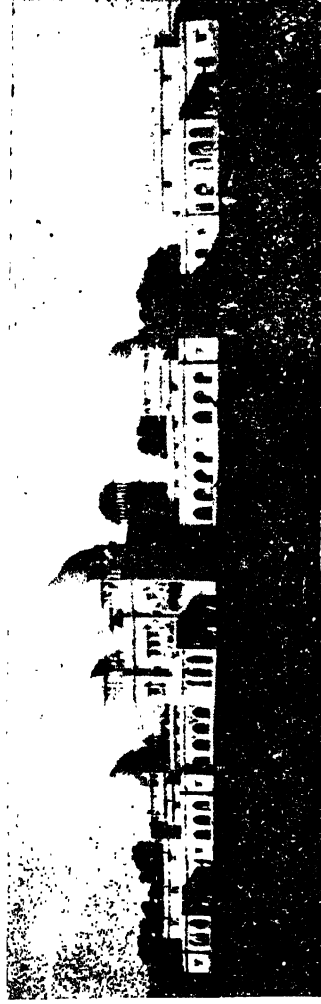
Isabella
Thoburn
College for
women,
Lucknow
Class Day
1912

Kallicota
College
Berhampur

D. A. V.
College.

Allahabad
Christian
College
Allahabad

Delhi Hindu
College.



**THE AGRICULTURAL COLLEGE AND RESEARCH LABORATORIES,
CAWNPORE, U. P.**

OPENED 18TH NOVEMBER, 1911.

By the Courtesy of A. W. FREMANTLE, Esq., *Principal.*



We are glad to insert the following note regarding the Cawnpore Agricultural College as also the photograph kindly supplied to us by Mr. A. W. Fremantle, the Principal.

Following on a visit from the Viceroy on the 17th November 1911, the Agricultural College and Research Laboratories Cawnpore were formally opened by His Honour the Lieutenant Governor of the United Provinces on the following day.

The Building was designed by Mr. Wildeblood and Mr. Oertel of the Public Works Department and the work was in charge of the Resident Engineer Lala Wazir Shai under whose supervision the whole of the College and Laboratories were built and fitted.

The Building is in the form of 3 sides of a square, of which the main block is depicted in our illustration, the Chemical and Biological wings which face North and South being at right angles to it.

The main block contains the central Hall, which is used as a Library and Reading Room, under the central dome, an Examination Hall, 2 Lecture Theatres under the smaller domes, a Class Room and the Principal's room. While above the central Hall is a gallery, a portion of which will contain a collection of Agricultural products etc., remainder being devoted to the Principal's office and a Lecturers, Waiting Room.

The Chemical wing contains large Chemical and Physics Laboratories and a Lecture Theatre for Students and a Research laboratory, the Agricultural Chemists, Room and Store Rooms etc.

The Botanical wing contains large Botanical and Zoological Laboratories, a Lecture Theatre for Students and the Research Laboratory, the

Economic Botanist's Room, Photographic Rooms etc.

The Laboratories are particularly well fitted with the most up to date arrangements for Gas, Water etc.

The Building is throughout faced with the finest white stone from Gwalior and the arches, domes, cupolas etc. are all copied from the Indo-Saracenic architecture to be found at Agra.

The total length of the frontage is 526 ft. and the height of the main dome is 94 ft and that of the smaller ones 65 ft.

The entrance to the College is through an old pre-mutiny Public Garden which contains some trees and a beautiful Tank and the front of the College is well laid out as a lawn; the buildings and grounds combine to form one of the finest modern Colleges in India.

The Government of the United Provinces is prepared to receive applications for technical scholarships of £150 a year, each tenable for two years, enabling the holders to proceed to England or other western country in order to obtain instruction in one of the following industries:—

- (i) Mechanical engineering,
- (ii) Electrical engineering.
- (iii) Manufacture of paper.

The possession of a university degree is not required, but candidates must possess a thorough knowledge of English and must be qualified either by a scientific education or practical experience to profit by one or other of the courses of study which has been indicated. It is desirable further that they should already have some connection with the industry or should be in a position to turn their training to practical use on their return to this country. Applications, giving full details of qualifications and antecedents, should reach the Secretary to Government, Industries Department, Allahabad, not later than the 1st March, 1912. The applicants should state which industry they select and what their qualifications are specifically in

Technical
Scholarships
for the U. P.

respect of the industry selected. Candidates must clearly understand that they will have to depend upon their own exertions when they return to India and that the Government does not and cannot undertake to provide them with employment.



The *Hochschul Nachrichten* is raising its voice against *Schnellzug* and *Ehren-Promotionen*, that is to say, against the creating of doctors at an express rate, and *honoris causa*.

Doctors
again

At a small University like Rostock the fees payable by Doctors of Law at graduation yield a sum of £200 for each ordinary professor (*Ordinarius*) in the Faculty of Law; at Heidelberg the amount is about £525. Heidelberg has long been known for the easy grace with which she bestows the foreigner. In a recent year, out of 222 doctors 155 had never matriculated as students of the University. The daily press has just been reporting her liberality in the year 1910-11, when no less than 392 doctors' hats were bestowed, 213 in the Faculty of Law, 89 in Philosophy, 63 in Medicine, and 27 in Natural Science and Mathematics. The technical *Hochschulen* seem to be producing honorary doctors on liberal scale.

The following clipping from the Pittsburgh University Journal tells of the founding of a cosmopolitan club in Pittsburgh University U. S. A. by Mr. Paul Chowey, a former Student of the Allahabad Christian College. Such clubs are

Foreign
Students form
an Inter-
national
Association

formed in nearly all the American Colleges and Universities.

At a meeting of the foreign students of the University, called together by Mr. Paul Chowey, a University Cosmopolitan Club was organized. This is a much needed club and should prove a great success. Its motto is "Forward." Its aims and other information appear below:

1. To produce a friendly intercourse between students from all lands irrespective of race, caste or creed.
2. To make the student feel at home in the University.
3. To extend a knowledge of the land they represent and an interest in the people of their country. (This can be promoted by having weekly meetings in which short talks may be given on different lands. And when opportunity affords to social gatherings.)
4. To co-operate with all efforts made for advancing education and social reform. (For this purpose arrangements will be made to get the best authorities in the city to give instructive addresses.)
5. To develop the mental, moral, and physical faculty of its members.
6. Above all to emphasize the brotherhood of man, the first step toward the goal of a world-wide peace.

In all proceedings of the club the principle of non-interference with religion to be strictly maintained.

Candidates for admission as members must be proposed by a member and if approved by the Executive Committee, must be elected by a majority of two-thirds present.

Officers—President P. P. Chowey, Bombay, India; Secretary, R. E. Peterson, Maleras, Sweden; Treasurer, P. Manos, Arcadia, Greece.

Lands represented: Japan, China, Korea, India, Syria, Roumania, Greece, Italy, Germany, Spain, Sweden, Russia, England, North and South America.

WHAT OUR STUDENTS ARE DOING ABROAD.

A Bengali Student's Success.—The "North Cheshire Herald" wrote on December 23rd, 1911 :—"It will be pleasant news for our readers in Hyde to hear that our friend, Mr. N. N. Bose, of the Borough Surveyor's Department, Town Hall, Hyde, who has come over to England from India for the purpose of acquiring special theoretical and practical knowledge in municipal and sanitary engineering has been honoured by the Institute of Municipal and county Engineers electing him as an Associate Member, and by the Royal Sanitary Institute as a member, on his graduating in municipal and sanitary engineering. Mr. Bose has been with us for about eighteen months, and has proved himself very popular, taking a very great interest in all things appertaining to the welfare of the town. We have every confidence that our friend will be succesful in his future career, and will give good service to his country, when he returns, and prove himself a worthy citizen of our great empire."

The Indian Medical Service.

The result of the recent competition for twelve commissions in His Majesty's Indian Medical Service, which was held at the Royal Army Medical College and at the Examination Hall, Victoria Embankment on January 22, 23, 24, 25, 26, and 27, 1912, was announced on Saturday (January 27). The following Indian gentlemen weresuccessful :—

Jamasp Cursetji Bharucha, L R. C. P., M. R. C. S., Lond. Hosp. (4th); Heerajee Jehangir Manocjee Cursetjee, M. B. B. S., Cantab., L. R. C. P., M. R. C. S., L. M. & S., Bombay Camb. Univ. and London Hosp (6th); Jogesh Chandra Dey, M. B., Calcutta, Calcutta Medical Coll. (10th.)

Royal Colleges of Physicians and Surgeons.

LONDON.—First Conjoint Examination.—Physics : Mian Mohammad Shaffi, Gauri Dayal and Ram Singha.

Second Professional Examination.—A natomy and Physiology : Narayan Krishna Bal, Subramanya Doraisamy, Kambeera.nda Cariapa Mandana, Bhamini Mohan Mitra, G F. Rodrigues, and R. R. Htoon Oo Tha.

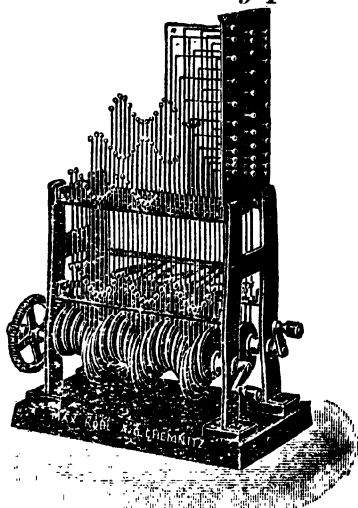
Diplomas in Public Health.—Diplomas have been granted to M. M. Cowasjee, L R.C.P., M.R. C. S., S. Maitra, and M. N. Mitra, L.M.S.

Royal College of Physicians.—Licencés have been granted to the following :—Miss Nagubai Moreshwar Joshi, Bhagat Ram Khanma, and Kavasji Cursetji Mulla-Feroze.

EDINBURGH UNIVERSITY.—In December the degree of Bachelor of Medicine and Bachelor of Surgery was conferred upon Bindeshwari Prasad, Sahib Singh Sokhey, B Sc., and Peter Vieyra.

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ENGLAND.

THE BEGINNING OF THE CALCULUS.

By Principal R. P. PARANJPYE, B.Sc., M.A.

The Calculus is perhaps the greatest discovery in the whole realm of mathematics and physical science if we leave out of account the first primitive ideas on number. The subject matter of the Calculus takes in all branches of learning and research where one has to do with a continuous magnitude *i.e.* a magnitude which does not change by sudden jumps, but takes, while passing from one value to another, all the intermediate values. The philosopher will doubtless be acquainted with the old maxim *Nature non agit per saltum* "Nature never works by sudden leaps." Hence the whole of nature is the subject matter of the Calculus. The recent history of the physical sciences may be regarded as a continual verification of this principle. Whether it is the abolition of the absolute distinction between solids, liquids and gases, whether it is a recognition of the fact that chemical elements are not such rigidly distinct kinds of matter as was supposed in the beginning, or even whether it is in the classification of animals and plants or in the problems of heredity variation, the principle of continuity long ago recognised by philosophers has come to be the fundamental and guiding landmark of science. And it is not much to say that the real advance of any physical science is to be measured by the range within which the Calculus can be applied to it. But this is not all. The Calculus has been recently applied successfully to questions of economics and statistics and the application, regarded as absurd *a priori* by several economists in that these sciences deal with discrete facts and not with continuous magnitudes which are the subject matter of the Calculus, has been justified and is bearing fruit owing to the fact that the cases to be considered in these sciences are very large in number and vary from each other only by insensible gradations.

To go back to the germs of the Science one has of course to go to the Greeks. The Greek Geometers as soon as they left the discussion of the

circle and came to the consideration of Conic Sections had to define what is meant by the tangent of the curve or the direction of the curve at a point. But even if this be disregarded one may say that the first problem to be solved by a method which is entirely akin to the Calculus is the finding the surface of the sphere by Archimedes. The method used by them was called the method of exhaustions. It was shown that if the sphere was divided by a number of circles of latitude into rings of very small thickness the area of each of these rings was very nearly equal to that of the circumscribing cylinder. It can also be shown that this equality gets more and more close as the number of these rings is made larger and larger and hence it was concluded that the area of the sphere is equal to the area of the cylinder. If this reasoning were put into modern language it would be represented by means of an integral and by a change of the independent variable. This discovery and another about the volume of a sphere were considered so epochmaking by Archimedes that he desired the figure of the sphere and the circumscribing cylinder to be carved on his tomb and Cicero relates that he saw this identical tomb with this figure in Sicily during his Governorship there.

Thus then the germ of the Calculus was found in Greek mathematics in their method of exhaustions; but no one was found to carry it further and it was only about the 16th and 17th centuries that the progress of mathematics made the discovery imminent. Though Descartes had no direct hand in this discovery yet his researches on analytical geometry smoothed the way for it. Euclid once answered to the king who wanted an easy way for learning geometry that there was no royal road to geometry. Descartes however has practically found it. He showed how a geometrical locus can be paraphrased algebraically into one equation between two quantities and that every property of the locus has some equivalent in the equation. All figures can in fact be avoided, the results worked out and then if necessary finally interpreted. The drawing may be wrong but the symbols will not betray you. Lagrange in fact took pride in the fact that in his classical treatise *Mechaniquis Ana-*

lytique on mechanics *i. e.* statics and dynamics he did not use a single geometrical figure. All the principles of mechanics can be worked out in mere symbols. This invention of analytical geometry by Descartes has been of great use to the Calculus, just as the Calculus has on the other hand helped analytical geometry. The special problem of tangents—or of finding out the direction of the curve at any point—was solved by Descartes in a clever way but that way is only indirectly related to the Calculus. Several others had done something towards its solution. But here come two famous men on the scene, Newton and Leibnitz, to whom the invention seems to be independently due. The question of priority has led to a heated controversy which has hardly yet subsided and which soon took the form of bitter international recrimination among scientists.

The particulars—so far as we can be certain on them—are soon told. Newton who at Cambridge was soon recognised as the leading star in England and for whom Barrow had resigned his chair of mathematics at Cambridge, had made several researches but had hardly published anything except some notes on Optics. During the time of the plague he had worked some of his ideas on universal gravitation though he had to lay them aside on account of a mistake in the known distance of the moon and had also worked out his new theory of fluxions. He had used these fluxions in solving several problems and had worked out many of the propositions in the Principia with their help though in formulating them in the book itself he had cast them in a severely geometrical form. He did not wish to endanger the acceptance of his main propositions by any incidental discussions about the methods used. Newton's manuscripts make his discovery of his fluxional calculus about 1666 quite certain. Newton had never published his discovery. He had been perhaps disgusted at some of the controversies raised by his previous publications and he hardly published anything except under great pressure from friends. His results were however known to his friends and pupils. Leibnitz on the other hand was a German philosopher, politician and mathe-

matician. He interested himself in all things, was very busy in politics, had written on philosophy and was in correspondence with scientists in all parts of the world. He was a fellow of the Royal Society of London and while in London once he came into contact with Collins and Oldenburg, though it does not appear that he communicated directly with Newton. In 1664 he published his first part under the title "*Nova Methodus pro maximis et minimis, itemque tangentibus, quae nec fractas nec irrationales quantitates moratur et singulare illis calculi genus.*" In the *Acta Eruditorum*, a scientific journal which he edited, he gave a general method for the problem of tangents, and for problems of maxima and minima; a few years later in other memoirs he worked several propositions in the theory of the Diff. Calc. several of which are used even now just as he left them. In one of these he mentions having read Barrow's *Lectiones tum Opticae tum geometricae*, but says he did not derive any help from them. In about 1704 in an anonymous review an attempt was made to challenge Newton's claim to the discovery of the Calculus and a bitter controversy arose. A letter from Oldenburg to Leibnitz in answer to one of Leibnitz is extant in which while Newton gives the solutions of several problems says he has also a new method which he veils in an anagram undiscoverable by one who has not the key to it. This letter dated about 1669 is important and the anagram contains the following sentence "*Una methodus consistit in extractione fluentis quantitatis ex aequatione simul involvente fluxionem ejus.*" The judgement on the whole controversy seems to be that both Leibnitz and Newton discovered their Calculus independently, that the notation is different but that of Leibnitz is more convenient and has in fact been always used. The controversy later on became very bitter almost ending in personal abuse and the whole only exemplifies the remark of Pascal "*les grands hommes, quelque eleve's qui's soient, si sont-ils semblables aux moindres par quelque endroit.*"

From international jealousies Leibnitz's notation was confined to the continent while Newton's was current in England. As said above Newton's

notation is inconvenient and for one century England was cut off from all participation in the great advance made on the continent during the eighteenth century. After Leibnitz the two brothers Bernoulli did much to extend the Calculus and Euler, Lagrange, Laplace and others made other discoveries, the last in particular translated Newton's Principia into the new notation and extended greatly its range.

The differential and the integral Calculus having been fairly started on their way by Leibnitz, the Bernoullis and others, some other problems gave rise to the Calculus of variations. The first problem was the problem of the curve of quickest descent *i. e.* to find the form of the curve such that if a body be let fall along it from rest, it will reach the lower point in the shortest possible time. This problem was put by Bernoulli as a challenge and was solved by both Leibnitz and Newton. But in their hands it did not lead to anything. It was Lagrange who made it the basis of a science which he called the Calculus of variations. The principle is that of maxima and minima but only more intricate.

The range of the Calculus was later on extended very greatly by Abel, Legendre, Gauss and above all by Cauchy, the last of whom laid the systematic foundation of the theory of functions of a complex variable. The science—we now generally call it analysis—is so vast that neither Leibnitz nor Newton would recognise it as their own offspring.

The root idea of the Calculus is that of a function. When one quantity depends upon another in any manner whatsoever as that the value of the first can be found as soon as that the second is known, the first is called a function of the second. This dependence may be of the most intricate character. When the nature of this relation is slightly contracted we are able to make use of it. Naturally the first limitation we introduce is that of continuity except at a few points. It has to be clearly understood that functions can be imagined which are everywhere discontinuous though of course such functions do not occur in nature. Well then, the limitation of continuity having been postulated, the next that we proceed to is the idea

of the rate of change. Here again examples have been given theoretically by Weierstrass in recent times that every continuous quantity has not necessarily a rate of change. The postulation of a rate of change is thus analytically a further limitation on the idea of a function.

Consider our vague idea of the velocity of a body moving, for convenience, in a straight line and let us try to make it more definite. If the body is moving equably *i. e.* describing the same distance in the same interval and proportionate distances in proportionately smaller or bigger intervals, we say that the velocity is uniform. Thus for a uniform velocity of five miles an hour the body must not only move five miles every hour but $\frac{5}{2}$ miles in half an hour, one thousandth part of five miles in one thousandth part of an hour, one millionth in one millionth and so on. If this is always true, the velocity is uniform. Suppose now the body does not move equably. For instance consider a railway train at any instant. To find its velocity per hour, we should see what distance it travels in a very short interval. Suppose we observe how much it passes in one second, $\frac{1}{2}$ a second, $\frac{1}{10}$ th of a second and so on. After finding these spaces we find by a rule of three in each case how much distance would have been gone over in an hour at the same rate. Generally of course we shall get different answers according as we take our data the distances moved in one second or $\frac{1}{2}$ " or $\frac{1}{10}$ " and so on. (These answers would be the same only if the velocity were uniform). There is no ground *a priori* to say that these answers should even be nearly equal. It is assumed however that these answers although different are such that they become more and more nearly equal as we take smaller and smaller intervals of time to calculate them from. In mathematical language we say that they have a limit *i. e.* they all approach a certain number for every particular instant. This number we call the velocity of the body at that instant. When this idea of a velocity is completely grasped, the principle idea in the Calculus is yours. In fact Newton's fluxion means nothing else but this rate. He supposes

any changing or fluent-quantity x to vary with time. In time o suppose it changes by $x' o$, then x' is called the fluxion when o is taken exceedingly small. Generally x' will itself be a changing quantity; if this be taken as the fluent its fluxion will be x'' . In the language of mechanics if x is the distance described, x' is the velocity and x'' the acceleration.

Leaving aside the idea of time which Newton introduced we make any quantity our independent variable and find the rate of change of the dependent variable with respect to it. To use mathematical language if y is the dependent variable and x the independent, we find the value of y when x is changed, say, to $x + \Delta x$. If the change in y is Δy , we consider the fraction $\frac{\Delta y}{\Delta x}$ and find its value for successively smaller and smaller values of the increment x . If this value tends to a certain fixed value more and more closely we call that value the rate of change of y . This is called the differential co-efficient of y with respect to x .

As I said above, every function, even every continuous function, is not differentiable *i. e.*, does not admit of a differential co-efficient. To impose upon a function the condition of differentiability limits its nature and extent. But fortunately almost every kind of function that we meet with in nature admits of this property. Colloquially Prof. Klein calls such functions reasonable functions *Vernunftige Functionen* and almost every function occurring in nature presents this reasonableness (*Vernunftigkeit*). One may naturally wonder why we should go into these details only to discover that we don't want them. But it is a false aim of science to discuss and propound theories in view of their immediate applications. Applied science may make use of these theories, may even propound problems to the pure scientist, but it has no right to say these problems and no other should be attempted. If such a one had objected to the Greek *Geonfeter* Apollonius when he discussed his conic sections as things of not the least value to any body, Apollonius could not have given an answer except to say that such discoveries show the stretch

of human brain and that they form a legitimate exercise for the intellect of man. For over eighteen hundred years this lame justification was the only one possible. But when Kepler discovered his laws, when these curious but useless conics took their part in the arrangement of the universe and when it was found out that the loci obtained by the intersection of a right circular cone by a plane are exactly the paths of planets round the sun or of the double stars round each other, the astronomer and the practical scientist blessed the day when Greek geometers discovered these seemingly useless curves to solve the still more useless problems of trisecting an angle or duplicating the cube. In the same way one never knows when a mere curiosity of the pure mathematician will be found of absorbing importance in its applications, and at any rate such curious theories show to what heights human reasoning faculty would rise.

I have tried to give above an idea of what we mean by the rate of change of a varying quantity. I will now explain one of its uses. The problems of maxima and minima are staring us in the face wherever we look about us. It is not too much to say that all nature if properly examined is one vast problem of maximum and minimum. The whole science of Optics can be based on the single fact that the path of a ray of light is such as to make the time, to go from any one point in its path to another, a maximum, supposing that the velocity is proportional to the refractive index. Helmholtz and Kelvin have shown that the whole science of dynamics can be based upon the fact that in any system of bodies moving under a given system of forces, of all possible motions that one is actually attained which shows the greatest amount of kinetic energy and the least amount of potential energy and this applies not only to ordinary dynamics but to hydrodynamics or the motion of fluids. Lagrange's famous equations in rigid dynamics are nothing but the mathematical expression of these facts. In the theory of chemical combinations the one guiding principle is that that particular reaction will take place under any given circumstances which will produce the greatest amount of heat; and if heat be regarded

as a mode of motion what does this mean but that the kinetic energy will be the greatest possible? These higher problems are later applications of the Calculus and in particular of the Calculus of Variations in addition to the other two *viz.* the differential and the integral. To take however the ordinary problem of the maximum and minimum. When any quantity reaches its maximum at any particular point, it has been increasing till then and then after that moment it begins to decrease; in the language of the Calculus the differential co-efficient or the rate of increase was positive till then and after that moment it becomes negative. Now as with all reasonable functions the differential co-efficient is continuous, it cannot go from a positive value to a negative value except through zero and hence the condition for a maximum is that the differential co-efficient must pass from positive to negative through zero at the critical point. For a minimum the rate of increase must pass from negative to positive through zero again. These simple conditions appear difficult when expressed in technical language but they are exactly what we see in practice. Many problems involving maxima and minima can be set in practice. The intuitive fact that the straight line is the shortest distance between two points is an illustration of the problem. Another problem which engaged the attention of Leibnitz and Galileo is the problem of the Catenary or the form of a uniform chain hung up at two points. Here again the solution is obtained from the simple fact that the centre of gravity of the chain is as low as as possible.

Long after the machinery of the Calculus was fairly complete, scientists began to look to their foundations to see that they were solid. The latter part of the nineteenth century will be characterised in the history of mathematics as pre-eminently the time of consolidation. In the beginning the great men of those times were busy constructing the edifice, laying the foundations as solid as they could make. They literally followed the celebrated advice of D'Alembert "Allez en avant; et la foi vous viendra." "Go ahead, faith will come to you." Cauchy might be

said to have begun this work of examining the foundations and he did it thoroughly so far as he went. Infinite series had been used before by many men but they had failed to see the great difference between a finite series of operations and an infinite series. Even men like Euler had used what we now call divergent infinite series and hence several of their conclusions had been wrong. It may be said in passing that Leibnitz and Newton had seen the necessity for a detailed examination of this matter but had been unable to work it out in detail. It is a fortunate circumstance that most of the series actually obtained without strict examination have now proved quite satisfactory. Cauchy in a celebrated memoir laid the foundation of the theory of infinite series and he so impressed Laplace with the cogency of his reasoning that as soon as he went home he put aside the work on which he was then engaged and denied himself to all visitors in order to see if any of the demonstrations given in his "Mécanique Céleste" were invalid, and he was relieved on finding that no material errors had crept in his work. Again Fourier had by means of his classical series showed that discontinuous functions can be represented by a series of continuous functions and this gave a great shock to all current ideas. The proofs of Fourier had however left much to be desired and his investigations were completed and vindicated by a German named Dirichlet. This gave impetus to certain new investigations on the ideas of number, incommensurability, continuity &c., and under the guidance of G. Cantor has led to a new branch of science called the theory of aggregates. I recommend this theory of aggregates to men of a philosophical turn of mind as it deals with first principles only and does not postulate much anterior knowledge of mathematics. In English *Young's Sets of Points*, in French *Borel's Leçons sur la théorie des Fonctions* and in German Cantor's Classical *Mengenlehre* can all be recommended. This will revise several of our vague ideas on these matters.

This is not the place to talk of the progress of the Calculus. This however can be said. In its

history mathematics has been always connected with philosophy. Whether we think of Plato, Leonardo, Leibnitz, Descartes, Kant or Poincare, we find that they are almost equally eminent both in Philosophy and Mathematics. Several branches of Mathematics deal with primitive ideas of number, space, time and it is very likely that they will shed new light on each other. The intense specialisation of these days renders an intimate acquaintance of both very difficult of acquisition but a formal call now and again would not be out of place even though each has started upon an independent career for herself.

Stray notes on Indian Education.

The first thing that strikes one when thinking of Indian students is the utter neglect of their health. In their hurry to improve their mind as soon as possible they forget there is such a thing as their body which equally needs improvement. The cramming of too many facts within an inadequately short period a condition unavoidable for the purpose of shining in an examination—and the feverish worry consequent upon the results of the examination, not infrequently prove too much for weak nerves and many come out of the Universities with their health in a deplorable state.

The chief remedy of this well known evil seems to be the right understanding regarding the value of examination. Of course one can quite well appreciate the ambition of a student to distinguish himself in the examination but he cannot be forgiven if he considers the exam. honours as the greatest achievements of life. He should always bear in mind that a man acquires permanent fame by what he does in his maturer years and not by the achievements of his student life. If he ruins his health by his studies, he deliberately throws away the chance of attaining fame for the paltry honours of student life. In fact whenever I find a young man neglecting his health for his bookish knowledge I am reminded of Franklin's famous episode of the whistle and think that this man is paying too much for a whistle.

Many persons wonder why the Indian graduates take no interest in the subjects of their study as soon as they are out of the College. The reason is not far to seek. They have got to be well drilled in their subject for the examination and this kind of compulsory work at high pressure with dread of exam. staring them in the face naturally brings on nausea for those subjects and they feel relieved of a great burden when the fatal examination days are over. The ideas associated with रसुध्न or Physics are not the ideal तपोवन of ancient India or the beautiful working of natural Laws but they are the heaps of etymological notes or the perplexing exam. questions. No qualification is so essential, according to Professor J. J. Thomson, for success in any subject as a living enthusiasm for it. And there cannot be thought out a method better adapted to dry up all enthusiasm for the subject of study than the examination system now in vogue. Now there is hardly any quality more essential to success in research than enthusiasm. Research is difficult, laborious, often disheartening. Unless he has enthusiasm to carry him on when the prospect seems almost hopeless and the labour and strain incessant, the student may give up his task and take to easier, though less important, pursuits.

I am convinced that no greater evil can be done to a young man than to dull his enthusiasm. In a very considerable experience of students of physics beginning research, I have met with more—many more—failures from lack of enthusiasm and determination than from any lack of knowledge or of what is usually known as cleverness. [In this connection I am tempted to quote the learned professor's criticism of premature specialisation by college students.] "The continual harping from an early age on one subject, which is so efficient in quenching enthusiasm is much encouraged by the practice of the colleges to give scholarships for proficiency in one subject alone.....The premature specialisation fostered by the preparation for these scholarships injures the student by depriving him of adequate literary culture, while when it extends, as it often does, to specialisation in one or two branches of science, it retards the

progress of science by tending to isolate one science from another."—Presidential address by Professor Sir J. J. Thomson in the British Association, 1909.

While speaking on physical culture, I shall mainly restrict myself to the considerations of food and exercise. As regards food there is hardly any important rule which is not known by the average student. The pity is there are so few of them who will act according to their knowledge. To obviate this defect, the student will find it a good rule to refresh his memory every now and then and get a vivid impression on his mind of the simple laws of hygiene. And it is with this object that the following casual remarks are set down.

People forget that eating is an enjoyment—an innocent enjoyment. And the food is not only to be nutritious but also lasting. It is a matter of common experience that one digests a lasting food more easily than a distasteful one. The physiologist will give you the reasons for it, namely, that the digestive juices are more copiously secreted in the former case. Thus the act of cooking which will make dishes lasting without making them too rich in spices and fat, is one of the most important arts we can think of in our country from time immemorial, the skill in cooking has been considered to be the greatest accomplishment of a lady. For those who care more for the opinion of the western savants here are the eloquent words of Dr. Kellogg, a celebrated American physician "altogether too little attention is paid to the subject of cookery as a science.To become a good cook requires as much native genius and far more practical experience than to become a musician or a school teacher, or even to enter some of the learned professions. The position of cook ought to be made so respectable and lucrative that it will attract persons of sufficient mental capacity and culture to make the art subservient to the purposes for which it was first employed and designed." (Home Hand-book of Hygiene and medicine, page 282). It is with great shame that I admit that our ladies, though they may have acquired some crude idea about Geography and

music, are much more deficient in the important art of cookery than their grand-mothers. And I simply pity the lot of those who for their food have to depend on the tender mercies of ill paid Brahman Cooks, *who one of my friends styles as "male incarnations of Drawpadi of old."*

Now, I should like to point out some misconceptions regarding the subject of physical exercise. The first question one should ask himself is—"what is the aim of exercise?" The shortest answer probably is: "The aim of physical exercise is to make the body healthy and fit to serve the mind". It is not infrequently seen that some persons look upon exercise as a means of improving their muscles only without caring for the health of the vital organs of the body, the most important of which undoubtedly is the brain. Indeed the importance of muscles has been overestimated. In these days of machinery what do you gain if you are capable of lifting twenty maunds of weight or become a champion of wrestling. The strongest man is as helpless against a musket ball as a weak one. Moreover exercises that develop muscles best, such as dumbbell exercises and wrestling, are defective when considered from the view point of physical culture too as they do not develop lightness of body and agility of movement as walking for example, will do. A gentleman of Rajputana once said "come we, Rajputs, do not care much for wrestling and such like exercises which tend to make people bulky we prefer riding, hunting and sword exercises as they give us agility and hardihood." True, the Bengali students are not going to be military men like the Rajputs but I think few will object to the statement that a normally constituted youngman should be ashamed of his bodily defects if he cannot run a mile without losing his breath or walk a dozen of miles at a stretch or even cannot swim for a few minutes. You who are using up your life's blood in exertions to improve your mind should reasonably withhold a little care for the improvement of your physical abilities. Instead of remaining an unavoidable burden let your body be a helpful servant of your mind.

As has already been pointed out exercise should

make us *healthy* along with the development of our physical aptitudes. Strong and healthy are not synonymous terms and it has been observed that many athletes die premature death the reason being that they cared only for their muscles and not for their health. Exercise, if it is to be healthy, must be performed in open air, preferably on the field or river where there is plenty of pure air. For deep breathing that accompanies exercise is very useful; and as Dr. Saluby has written in his nice book on Health, Strength and Happiness, "It has to be observed that deep breathing is of very little value unless it be the breathing of pure air..... If you have to choose between exercise in the ordinary indoor atmosphere and lying supine in the open air, you will do well to choose the latter.

Another important point is that exercise should not be a monotonous dull affair but must be such as can give pleasure and relax the brain, for the brain, the most important organ of the body, requires occasional relaxation for its health and that can be very well supplied by some pleasant exercise. The following words of the great philosopher Herbert Spencer are well worth remembering. "The common assumption that so long as the amount of bodily action is the same it matters not whether it be pleasurable or otherwise is a grave mistake.....The truth is that happiness is the most powerful of tonics Hence the intrinsic superiority of play to gymnastics. The extreme interest felt by children in their games and the riotous glee with which they carry on their rougher frolics, are of as much importance as the accompanying exertion. And as not supplying their mental stimuli gymnastics must be radically defective." Henceforward you will know what value you can attach to solitary dumb-bell exercises within a room or wrestling in a filthy courtyard.

Judged from the considerations of pure air and relaxation of the brain, outdoor games like football and cricket seem to be ideal exercises. Only to those players who over-exhaust themselves in the heat of interest, to the detriment of their studies, I shall say "A game is a game and

nothing more". And to those, by far the larger number of students, who are simply lookers on in a game my submission is that seeing a game may be a good relaxation but certainly it is not exercise.

For weaker people, walking may be substituted for the more vigorous exercise of the games. A very distinguished graduate of the Calcutta University, who showed the happy combination of health with scholarship, on being asked what was the secret of his success said "I used to spend two hours every day on the maidan with my friends when I was reading hard." And though I may be accused of repeating truisms I shall again remind my young friends that when walking they must forget everything about examinations and studies and should chat carelessly and laugh heartily.

The last though not the least important thing I have to say is that the monotony of life should be broken by occasional tours and excursions. And here you get education along with health; for the first hand knowledge you acquire of your country and its people by frequent excursions will prove an invaluable acquisition in after life. There is ample room for the exercise of your imagination and originality in planning out different modes of excursions. For example, you may form a party of friends, hire a boat and spend a delightful week, rowing up or down some chosen river. Or some of you may turn tramps for a time and traverse a few score of miles on the plains or the hills. These excursions will supply you with materials for many essays, poetic as well as scientific. As for me, of the recent productions of the poet Robindra Nath, what excited the greatest interest was the description of Gora's excursion in the country, as given in the novel, *Gora*.

S. C. MUKERJI.

On a complete Investigation of a Phenomenon taking place beyond the Critical Angle

(Continued from Page 287)

III.

On a Complete Law of Refraction.

* It has been shewn in the preceeding paper that the ordinary law of refraction does not hold good universally. The reason for the deficiency is that the law is deduced on the assumption that the paths of the incident and the refracted rays remain straight when light passes from one medium to another. The law, therefore, holds good for points situated on the straight portions of the paths and does not become applicable for points situated on the curved portions of the paths. The object of the present paper is to deduce a law that will have a general application.

Expression for the Sine of the Angle of Incidence.

Let θ be the angle which the tangent at a point on the hyperbolic path of the incident ray makes with the normal to the surface of separation XX' .

Let x, y be the co-ordinates of the point referred to the axes of the figure as co-ordinate axes. Then the equation of the hyperbola is—

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1 \text{ where } a = \frac{k}{2} \text{ and } b = \frac{\sqrt{(d^2 - k^2)}}{2}.$$

Differentiating with respect to x we get.

$$\frac{2x}{a^2} = \frac{2y}{b^2} \cdot \frac{dy}{dx}, \text{ that is } \frac{dy}{dx} = \frac{b^2}{a^2} \cdot \frac{x}{y} \text{ which is } = \cot \theta.$$

$$\text{Hence } \sin \theta = \frac{\frac{a^2 y}{\sqrt{(b^2 x^2 + a^2 y^2)}}}{\sqrt{\{(a^2 + b^2)y^2 + b^2\}}} - \frac{2ky}{\sqrt{\{4d^2 y^2 + (d^2 - k^2)^2\}}} \text{ substituting for } a \text{ and } b \text{ their actual values.}$$

Since d is always greater than k , the square of the numerator of above fraction is therefore always less than the square of the denominator. Consequently, $\sin \theta$ lies between 0 and 1. Writing $d \sin i$ for k the expression for $\sin \theta$ becomes

$$\sin \theta = \frac{2y \sin i}{\sqrt{\{4y^2 + d^2 \cos^2 i\}}} \dots \dots (11)$$

Expression for the Sine of the Angle of Refraction.

Let θ' be the angle which the tangent at a point

on the path of the refracted ray makes with the normal to the surface. Let x, y be the co-ordinates of the point. Then by a process similar to above

$$\text{we get } \sin \theta' = \frac{2k'y}{\sqrt{\{4d^2 y^2 + (d^2 - k'^2)^2\}}}$$

When v is greater than v' , that is, when refraction takes place from a less to a more refracting medium, d becomes greater than k' . The square of the numerator of the fraction is therefore less than the square of the denominator; consequently, the value of the expression for $\sin \theta'$ lies between 0 and 1. Since $k' = \mu \sin i$ (Eqn. 7)

the expression becomes by substitution

$$\sin \theta' = \frac{2y \sin i}{\mu \sqrt{\{4y^2 + d^2 \left(1 - \frac{\sin^2 i}{\mu^2}\right)^2\}}} \dots \dots (12)$$

When v' is greater than v , that is when refraction takes place from a more to a less refracting medium three cases arise.

Case 1. When $d > k'$, that is, $\mu \sin i$ less than one, the expression for $\sin \theta'$ lies between 0 and 1. Since k' is equal to $d \mu \sin i$ (Eqn. 9) the expression for $\sin \theta'$ becomes by substitution

$$\frac{2\mu y \sin i}{\sqrt{\{4y^2 + d^2(1 - \mu^2 \sin^2 i)^2\}}} \dots \dots (13)$$

Case 2. When $k' > d$, that is, when $\mu \sin i$ becomes greater than one the value of $\sin \theta'$ may still lie between 0 and 1 provided,

$$4y^2 + d^2(1 - \mu^2 \sin^2 i)^2 \text{ be } > 4\mu^2 y^2 \sin^2 i$$

$$\text{i.e. } d^2(1 - \mu^2 \sin^2 i) \text{ be } > 4y^2(\mu^2 \sin^2 i - 1)$$

$$\text{i.e. } d^2(\mu^2 \sin^2 i - 1) \text{ be } > 4y^2$$

$$\text{i.e. } y \text{ be } < \frac{d}{2} \sqrt{(\mu^2 \sin^2 i - 1)}$$

That is to say, so long as the point in question lies within the limiting distance given by Eqn. (10) the value of $\sin \theta'$ is real. In the limiting case, that is, when $y = \frac{1}{2} \sqrt{(\mu^2 \sin^2 i - 1)}$ the expression for $\sin \theta'$ becomes equal to one and then the tangent becomes parallel to XX' the surface of separation.

Case 3. When $k' = d$, that is, when $\mu \sin i$ becomes equal to one, $\sin \theta'$ also becomes equal to one.

Law of Refraction.

Since the directions of the paths of the incident as well as the refracted ray change continuously from point to point, the ratio of the sines of the angles which the directions of the paths at points equidistant from the surface make with the normal to that surface varies continuously. Thus for points on the two paths, the perpendicular distance of which from the surface is y , the ratio of the sines, when refraction takes place from a less to a more refracting medium, is

$$\frac{\sin \theta}{\sin \theta'} = \frac{2y \sin i}{\sqrt{4y^2 + d^2 \cos^2 i}} \div \frac{2y \sin i}{\mu \sqrt{4y^2 + d^2 \left(1 - \frac{\sin^2 i}{\mu^2}\right)}} = \mu \sqrt{\frac{4y^2 + d^2 \left(1 - \frac{\sin^2 i}{\mu^2}\right)^2}{4y^2 + d^2 \cos^2 i}} \quad \dots (14)$$

When y becomes infinitely large in comparison with d the terms involving d^2 vanishing, the quantity under the radical becomes equal to one and the ratio therefore becomes

$$\frac{\sin \theta}{\sin \theta'} = \mu \dots \dots \dots (15)$$

which is same as Equation (6).

Thus for points situated at a finite distance from the surface the ordinary law of refraction holds good.

When refraction takes place from a more to a less refracting medium the ratio becomes,

$$\frac{\sin \theta}{\sin \theta'} = \frac{2y \sin i}{\sqrt{4y^2 + d^2 \cos^2 i}} \div \frac{2y \mu \sin i}{\sqrt{4y^2 + d^2 \left(1 - \mu^2 \sin^2 i\right)^2}} = \frac{1}{\mu} \sqrt{\frac{4y^2 + d^2 \left(1 - \mu^2 \sin^2 i\right)^2}{4y^2 + d^2 \cos^2 i}} \quad \dots (16)$$

When $\mu \sin i$ becomes less than one, making y infinitely large in comparison with d , the expression under the radical becomes equal to one and the ratio therefore becomes,

$$\frac{\sin \theta}{\sin \theta'} = \frac{1}{\mu} \dots \dots \dots (17)$$

which corresponds to Equation (8).

Thus here, too, the ordinary law of refraction

holds good for points situated at a finite distance from the surface.

When $\mu \sin i$ becomes greater than one, y cannot be made to exceed $\frac{1}{\mu} \sqrt{(\mu^2 \sin^2 i - 1)}$.

Hence as y must be of the same order of magnitude as d , the terms involving d^2 cannot be neglected. Consequently, the expression under the radical (Eqn. 16) can on no account be made equal to one and the ratio can therefore never attain the limiting value $\frac{1}{\mu}$. Thus in this case, the ordinary law of refraction fails to become applicable.

The fact that the law of refraction for points situated very near the surface of separation of two media is not so simple as the ordinary law, was anticipated by Fresnel and supported by Lloyd whose views on the subject are quoted in the extract below—

Extract from the "Reports on the Progress and Present State of Physical Optics. Reports of the British Association Vol. III. p. 309."

"The total reflection of light at the surface of a rarer medium has been urged by Newton against the wave-theory, and the apparent difficulty seems to have had much weight in inducing him to reject that theory. It is, in fact, not very easy to perceive at first view why the disturbances of ether within the denser medium should not be communicated to the external ether and a wave be thus propagated to the eye, whatever be the obliquity of the incident wave. To this, it may be enough to reply that the law of refraction itself in its generality is a necessary consequence of the wave theory; and therefore that the phenomenon of total reflection which is a particular case of that law is likewise accounted for. But the principle of interference furnishes a direct answer to the difficulty. It can be shewn that the elementary waves, which are propagated into the rarer medium from the several points of the bounding surface, destroy one another by interference when the sine of the angle of incidence is greater than the ratio of the velocities of propagation in the two media or the angle itself greater than the limiting angle

of total reflection.¹ It is here supposed that the distance from the refracting surface is a large multiple of the length of a wave. The conclusion does not apply to points very near that surface : and for such points there is reason to think that the law of refraction is more complicated.² Experience shews, in fact, that light may issue from the denser medium, to an appreciable distance when the incidence exceeds the limiting angle of total reflection. If two prisms whose bases are slightly convex be put together, and inclination of these bases gradually changed while we look through them it will be observed, that beyond the critical angle, the light will still be transmitted in the neighbourhood of the parts in contact. By measuring the breadth of the space and comparing it to the diameters of the coloured rings, Fresnel found that the interval of the glasses through which deviation from the ordinary law of refraction³ occurred exceeded the length of a wave.² The analysis of M. Poisson points also to the same result, and it is proved that the medium will be agitated in the part immediately in contact with the first, this agitation decreasing rapidly and becoming insensible at a very minute distance from the surface."

J. RAY.

(To be continued.)



CHAUCER AND HIS CONTEMPORARIES

1340—1400.

In the midst of the almost barren literature of Anglo-Norman period, a writer appeared, who has deservedly earned for himself the credit of being the founder of modern English literature. This was Geoffrey Chaucer, "a man of mark, inventive

though a disciple, original though a translator, who by his genius, education, and life, was enabled to know and to depict a whole world, but above all to satisfy the chivalric world, and the splendid courts which shone upon the heights."¹

Chaucer (1340-1400) had taken an extensive tour in the world of knowledge. He read much and so his "works" is an epitome, so to say, of the "intellectual tastes and fashions of his time as well as of the three previous centuries." A voracious reader, he had a mind open to take in all influences, and this fact answers from his success as a character-writer. So picturesquely does he paint the characters of the tavern guests,—their appearances and habiliments ; their manners and customs etc—in his immortal *Prologue* that the reader almost see them face to face. Truly has Dryden remarked, in this connexion, "I see all the pilgrims in the *Canterbury Tales*, their humours, their features, and the very dress, as distinctly as if I had supped with them at the Tabard in Southwark."

Chaucer's writings fall naturally into three classes,—*translation* from French, *imitation* of Italian, and *original*. He began writing with translating French poems into his own tongue. He is principally indebted to Guillaume de Machault, to Eustache Deschamps, and to Jean Froissart,—the French poets most fashionable in his time. During the second or *Italian Period*, as it is called, Chaucer was under the influence of the great Italian poets of that time, as Petrarch and Boccaccio, as well as of the earlier Renaissance movement. He ended in writing independently and his great work of the last or *Original Period* is the *Canterbury Tales*.

Until the time of Chaucer, the struggle for supremacy among the Middle English dialects, had not come to a successful issue. John de Trevisa (1326-1412) was writing in the Northern dialect ; Laurence Minot (1300-1352) wrote in the *Southern*, while the alliterative poets, all except Langland, had recourse to *West Midland dialect*. Chaucer wrote in the *East Midland*, and by his

¹ See Fresnel "Sur les System des Vibrations lumineuses" Bibliotheque Universelle tom XXII.

² The italics are mine.

³ Ibid.

¹ Taine,

extraordinary genius and ability, aided by no less a potent force than Wycliffe, he established the *East Midland* dialect as the language of the royalty, and as King's English. Chaucer, however, was helped by the time and circumstances, because just when this supremacy was about to be established, the effect was hastened by the debasement of the *Anglo-French* (as a result of the severance of all communications between France and England,) "with which England had been for centuries engaged in a struggle far more momentous than that between the rival dialects, a struggle in which English was then winning all along the line." But, even when *French* had ceased to be necessary, it remained fashionable for some time to come. Gradually, in course of time *French* was supplanted by *English*, in all departments of human activity. In the first half of the fifteenth century, Henry V officially substituted *English* for *French*. The entry, which is in Latin, has been translated by T. R. Lounsbury, in the following manner :—

"Whereas, our mother-tongue, to wit, the English tongue, hath in modern days begun to be honorably enlarged and adorned : for that our most excellent lord, King Henry the Fifth, hath, in his letters missive, and diverse affairs touching his own person, more willingly chosen to declare the secrets of his will ; and, for the better understanding of his people, hath, with a diligent mind, procured the common idiom (setting aside others) to be commended by the exercise of writing ; and there are many of our craft of brewers who have the knowledge of writing and reading in the said English idiom ; but in others, to wit, the Latin and French, before these times used, they do not in anywise understand ; for which causes, with many others, it being considered how that the greater part of the Lords and trusty commons have begun to make their matters to be noted down in our mother-tongue, we also in our craft, following in some manner their steps, have decreed in future so to commit to memory the needful things which concern us."

About the close of the fifteenth century, Parliamentary laws, which had, after the Norman

conquest, been usually published in Latin, were put into English.

Chaucer is the English bard of the Medieval Ages, in a line with the Romantic poets of Italy—Boccaccio, and Froissart. Chivalric games and masquerades, tournaments and mock-fights, romantic love, silken visions, bright and splendid pageantry, ethereal angles and the like elements of medieval grandeur form the topics and incidents of Chaucer's sparkling lyrical verses and of his prose writings. "Chaucer", says Taine, "is like a jeweller with his hands full : pearls and glass beads, sparkling diamonds and common agates, black jet and ruby roses, all that history and imagination had been able to gather and fashion during three centuries in the East, in France, in Wales, in Provence, in Italy, all that had rolled his way, clashed together, broken or polished by the stream of centuries, and by the great jumble of human memory, he holds in his hand, arranges it, composes therefrom a long sparkling ornament, with twenty pendants, a thousand facets, which by its splendour, variety, contrasts, may attract and satisfy the eyes of those most greedy for amusement and novelty." Chaucer's first extant translation is that of *Roman de la Rose*, "that great storehouse of gallantry." This step, remarks Prof. Courthope, "is not remarkable only as making a landmark in the refinement of our versification." "It marks," he continues, "with equal significance the rise of a new spirit in English poetry, the importation of thoughts and themes from the continent announcing the approach of the Renaissance." The new 'thoughts and themes', just referred to, as has been pointed out by Mr. A. J. Wyatt, "were chiefly those of philosophy and satire ; the philosophy largely that of Beothius, filtering to Chaucer's mind at first through the 'Romaunt', the satire being the poignant satire of Jean de Meung himself on love, chivalry, and the church, the cherished ideals of middle ages."

Of Chaucer's contemporaries William Langland (1330 ?—1400) deserves special mention. After Chaucer's, his face looms most conspicuous of all of a whole gallery of portraits of the four-

teenth century litterateurs. His *Vision of William, concerning Piers the Plowman*, which is extant in three texts, is an admirable contribution to the history of English allegory. Barring certain defects, which have been pointed out by J. R. Green, in his *A short History of English People*, Langland's is perhaps the most intrinsically great and important work, both from literary and linguistic points of view, in the whole range of English literature. The Seven Deadly Sins, depicted by him, are exquisite and real pictures of abstraction. But Langland is not only a satirist; he is also a prophet, and in an extract (Passus X. B—Text) he makes a prophetic statement about the Reformation,

"An thanne shal the abbot of Abyndon and
[all his issu for evere,
Have a knnoke of a kynge and
[incurable the wounde."

There are more of such instances; but we need not multiply.

An admirable statement of comparison between Chaucer and Langland, has been made out by Mr. A. J. Wyatt. I make no apology for reproducing it in full:

"The contrast between Langland and Chaucer is as inevitable as that between March and May—the May of the poets. 'Chaucer describes the rich much more fully than the poor, and shows the holiday-making, cheerful, genial phase of English life; but Langland pictures the homely poor in their ill-fed, hard-working condition, battling against hunger, famine, injustice, oppression, and all the stern realities and hardships that tried them as gold is tried in the fire. Chaucer's satire often raises a good-humoured laugh; but Langland's is that of a man who is constrained to speak out all the bitter truth, and it is as earnest as the cry of an injured man who appeals to heaven for redress.' (Skeat). Both men had poetic souls; poetry was a necessary outlet for the genius of each: but with what a difference! The necessity in the one case was moral, political, religious; in the other it was literary, artistic. The contrast between the subjects and the versifications of their poems is equally marked and equally significant,

Organic unity of design is as conspicuous in the one as it is conspicuously absent in the other. As a literary craftsman Chaucer outdid all the predecessors in the middle ages, with the single exception of Dante; Langland, in apparent contempt of literary craftsmanship, helped to revive an antiquated metre for the sake of its mnemonic qualities, and, by sheer force of native genius, made his way high up in the ranks of the craft which he either ignored or contemned. Langland is at his best and greatest in detachable lines and passages; he is so far from maintaining a uniform level that whole tracts of his poem are nothing better than wearisome and often involved homilies. Chaucer, on the other hand, as a consequence of the artistic sense on which we have insisted, is greatest in the mass. As Lowell says (who, however, does bare justice to Langland), 'it is not in detached passages that his charm lies, but in the entirety of expression and the cumulative effect of many particulars working toward a common end.' Once more, Chaucer had come under the influence of foreign culture in a degree that was impossible for Langland. English of the English as we are proud to think Chaucer was, there is, as Jusserand says, 'something of a cosmopolitan tinge about him'; beside him, Langland is purely insular. 'Chaucer and Langland, the two great poets of the period, represent excellently the English genius, and the two races that have formed the nation. One more nearly resembles the clear-minded, energetic, firm, practical race of the Latinised Celts, with their fondness for straight lines; the other resembles the race which had the deepest and especially the earliest knowledge of tender, passionate, and mystic aspirations, and which lent itself most willingly to the lulls and pangs of hope and despair—the race of the Anglo-Saxons.' (Jusserand)''.

Langland, however, was outrivalled in poetical merit by a writer, who is known to us not by the name which he received at his christening, but by a name which the admiring readers of *Gawayne and the Green Knight* has given him—the Poët of "Sir Gawayne and the Green Knight". This author, who flourished about 1360-75, is the expo-

ment of the school of poets, who revived the alliterative poetry of the old English age, in the *West Midlands*. These poets produced long alliterative lines without end-rimes. Most of these were non-entities, but of the few who are 'prominent' the author of *Sir Gawain* is most that. It has been said, that this nameless author, together with his more distinguished brother-poets, Chaucer and Langland, would make a splendid trio of which any age may be justly proud.

A monument in St. Saviour's, Southwark, presents a human figure with its head resting on three volumes of books. That is to commemorate John Gower (1330?—1408)—'morale Gower' as he was called—a contemporary and friend of Chaucer, somewhat older, in age, though not in genius, than the painter of the Canterbury pilgrims. He is the author of three great poetical works—*Speculum Meditantis* (Mirror of one meditating), *Vox Clamantis* (voice of one crying), and *Confessio Amantis* (confession of a lover). The first of these is written in *French*, the second in *Latin*, and the last in *English*. This last "is a dialogue between a lover and his confessor, imitated chiefly from Jean de Meung, having for object, like the *Roman de la Rose*, to explain and classify the impediments of love."¹

Another contemporary of Chaucer—Laurence Minot (1300?—1352—is a little more than a name to us. He is the author of eleven martial poems, the subject matter of which extend from the battle of Halidon Hill in 1333 to the Capture of Guisnes in 1352. He is considered by some as the first English patriotic poet. He wrote in doggerel verse and there is nothing striking about him but his subjects, which are really noteworthy, as the invasion of France, the siege of Calais, the battle of Neville's Cross, and other such martial topics.

The great scottish poet of this age was John Barbour (1316?—1395), Archdeacon of Aberdeen. His *Bruce* is a typical representative of the Fourteenth century Scotch poetry. Mr. A. J. Wyatt

says of *Bruce*, "It is the work most typical of the national spirit in early Scottish poetry, the best expression of the intense feeling engendered by their forty years' struggle for national freedom." He wrote, of course in Northern dialect—the dialect spoken in the Lowlands of Scotland.

"In the age of Chaucer, there seems to have been a perfect agreement and understanding between the poets and their audience: the good manner and good temper of the readers bringing out the qualities of the poet. The courtly qualities of Chaucer, without his genius are to be found in Gower. In the next generation there was a change. Some how or other the fine manners of the time of Edward III and Richard II were lost, and for nearly two centuries there was a decline in literature. When poetry revived in the Elizabethan age, it was found that all the rudiments had to be learned over again, and with all their genius none of the great poets of that time were fortunate enough to recover Chaucer's secret, the perfect accomodation of his work at once to his own standard of excellence and to the intelligence and sympathies of those for whom he wrote."¹

AJAX.

CONTRIBUTIONS from STUDENTS.

PROSE AND POETRY.

Psychologists tell us that language, in its proper form, is an expression of the human mind. It is, in fact, the bond and creation of human Society, "the symbol and token of boundary between man and brute," and is the "barometer of national thought and character." It branches out into two parallel processes, prose and poetry.

The word, Prose, literally signifies the plain Speech of mankind when written or rhetorically composed without reference to the rules of Verse. Prose belongs to the elementary stage of language

¹ Taine.

¹ Thompson.

and is consequently the commonplace expression of ordinary human thought. Prose may be defined as consisting of all forms of careful literary expression which are not metrically versified. It is straight and plain, not an artistic product, but used for stating precisely that which is true in reason or fact. Words so arranged as to express a clear idea may be called prose. The essential characteristics of a 'fit prose' are regularity, uniformity, precision and balance.

Prose, however, is not everything that is loosely said, like the lisping words of a prattling child, it has its rules and requirements. In the earliest ages, no doubt, conversation, in the proper sense of the term, did not exist. The rudest fragments of speech were sufficient to indicate the needs of the savage and these blunt babblings were not prose. Later on, some orator, "dowered, with a native persuasiveness" and desirous of making an effect upon his comrades, would link together some broken sentences and produce with them something more coherent than a chain of ejaculations. So far as this was lucid and dignified, it would be the beginning of prose. "It cannot be too often said that prose is the result of conversation, but it must at the same time be insisted upon that conversation itself is not necessarily, nor often prose." But, in the learned discussions of high literary circles prose reigns Supreme, though a whole-hearted friendly gossip, the solace of life and man's sweet pleasure in the gay family circle, is not often conducted in true prose. Prose is not the negation of all laws of speech, it rejects merely those laws which depend upon metre.

But, if we take a comprehensive and practical view of prose, it is something more than what we have said above. It is the nucleus, the motive-power, the staple food, the principal element and chief production of language. What blood is to life, what bricks and mortar are to a building, that prose is to language. It is, so to speak, an everyday article, nay more, we needs must use it every moment. It is, what a Political Economist would call, a "necessary commodity" for the expression of our feelings.

Prose is the chief instrument for the expression

of our simple thoughts and sentiments, though sometimes in the master-pieces of the world-renowned prose-poets like Ruskin, Carlyle, Burke, Bacon and Emerson, we find that the language rises to a sublimity and a rapturous ecstasy found as a rule only in poetry.

Prose is the ordinary language of business and of Government. It is commonly used in magazines and newspapers, those engines, fountain-heads and exponents of public feelings. During the time of great revolutions, it is through the medium of prose (poetry also, in the form of songs and ballads exercises a marvellous influence upon the minds of the people) that the great thinkers, orators and politicians give vent to their views and opinions. The press, the platform, the records of society and of Government all need prose. No, we cannot do without prose.

Now let us think over it. Suppose, we make a grand plot to boycott prose for a single day; then what will be the natural consequence? Everything will go wrong in the domain of social intercourse, nay more, a dead melancholy silence will brood over the whole world. So, it is as clear as daylight that even the slightest attempt to disregard prose is futile and ridiculous. Give up prose and everything will come to a standstill, a perfect chaos will prevail.

Now, let us follow the stream of poetry. Poetry is the means whereby man gives vent to the intenser and more emotional side of his nature and voices the higher ideals of mankind. It is the subtle and emotional vehicle of man's sublime and most elevated thought. "It is," to quote the words of Wordsworth, "the breath and finer spirit of all Knowledge." We can also say, in the language of the Great Shakespear?

The poet's eye, in a fine frenzy rolling

Doth glance from Heaven to Earth, from Earth
to Heaven;

And, as imagination bodies forth

The forms of things unknown, the poets' pen

Turns them to shapes and gives to airy nothing
A local habitation and a name."

In modern criticism, the word, poetry, is used sometimes to denote any expression of imaginative

feeling, sometimes to designate a precise literary art which ranks as one of the fine arts. Wordsworth calls poetry "the impassioned expression which is in the countenance of all science." It is "the key to the hieroglyphics of Nature."

In poetry, grammatical rules are not always taken into consideration. A kind of fine frenzy, a divine madness, as we may call it, is necessary for the composition as well as for the appreciation of poetry. Plato says, "The poets are not in their right mind when they are composing their beautiful strains, because when they fall under the power of music and metre, they are inspired and possessed." If we at all desire to appreciate and enjoy poetry, we must be, as it were, divinely mad, we must wholly give ourselves up to the bewitching influence of poetry; we must forget our present surroundings and follow the poet up to whatever realms he soars in, be it the topmost citadel of Elysium or the fathomless depths of Erebus. By attuning our hearts to the thoughts and sentiments of the poet we see things generally which have no reality of their own and which exist only in the romantic world of ideal beauty, celestial love, chilling horror, heart-rending pain and tantalising hope. We cannot but take hold of our imagination until at last we are led away by the charm and fascination which poetry knows so well how to exercise. "Poetry itself is the strength and joy whether it be crowned by all mankind or left alone in its own magic hermitage."

Poetry expresses itself in other ways than language. To find "tongues in trees, books in the running brooks, sermons in stones", discoveries in the whispering breeze, anger in the raging tempest and hope in the blooming flower is genuine poetry. Hence, imagination only is the true essence of poetry.

Macaulay says, "As civilisation advances poetry almost necessarily declines." Is this always the case? No. Let me cite a few striking exceptions in support of my contention. Students of history are quite familiar with the fact that Æschylus, the father of Greek tragedy, produced his immortal works in the palmy days of the Greeks. It was at the time that Pericles was at the helm of the

State, when Athens became the citadel of light, culture and beauty, that the lofty and impressive plays of Sophocles and Euripides were exhibited on public stages. Let me cite another example: England in the 17th century was the home of light and culture; it was in the Elizabethan age that the immortal Spenser composed his exquisite work, "The Faery Queen" and the great Shakespear composed his unparalleled dramas. The sublime author of the "Paradise Lost" also flourished in these days.

Despite, however, the exceptions mentioned, we cannot totally deny the fact that poetry thrives most in a rude state of society, when imagination exercises, as it did in the days of Homer and Virgil, its fanciful but absolute hold over the minds of the uncultivated.

Poetry requires leisure and calm and serene thoughts. But, with the advance of knowledge, society becomes more complex and the struggle for existence becomes very hard; so, very few can devote their proper attention to the composition and advancement of poetry. And, probably, it is for this reason that world-renowned poets like Shakespear, Kalidas, Spenser and Milton are not to be seen now-a-days. Hence, we may say, that there is an element of truth in the fact that poetry is very rarely appreciated to its fullest extent in the enlightened and scientific days.

Poetry plays a very important part in our religious literature, in dramas, in Music and recitation. The immortal "Bhagabat Geeta," which is the essence of Hinduism, all the great epics—the Ramayana, the Mahabharata, the Iliad and the Odyssey are composed in verse. Drama is the meeting-ground of Prose and Poetry, as we see in the works of Shakespear and Kalidas. "Poets are the unacknowledged legislators of the world."

It is a deplorable fact that, mere metrical compositions sometimes pass for real poetry. The fact is corroborated by the remarkable saying of the Great Sydney who says that, "One may be a poet without versing and a versifier without being a poet." "The grand virtues of poetry," says Aristotle, "are truth and seriousness."

Poetry is indeed something divine. "It is at

once the centre and circumference of language." It is that which comprehends all science and that to which all science must be referred. It is at the same time "the root and blossom of all other system of thought"; it is that from which all spring and that which adorns all and that which, if blighted, denies the fruit and the seed to the tree of life.

"What were virtue, love, patriotism friendship, what were the scenery of this beautiful universe which we inhabit, what were our consolations on this side of the grave and what were our aspirations beyond it, if poetry did not ascend to bring light and fire from those eternal regions where owl-winged faculty of calculation did not ever soar?" Says Mathew Arnold, "and in poetry our race, as time goes on, will find an ever surer and surer stay."

Language, colour, form and religions and civil habits of action are all the materials and instruments of poetry. But poetry, in a more restricted sense, expresses those arrangements of language and specially metrical language which are created by "that imperial faculty whose throne is contained within the invisible nature of man."

Poetry strengthens the faculty, which is the "organ" of the moral nature of man, in the same sense as exercise strengthens the body. "The best poetry will be found to have a power of forming, sustaining and delighting us as nothing else can. A clearer, deeper sense of the best in poetry and of the strength and joy to be drawn from it, is the most precious benefit which we can gather from poetry." "But for poetry," says Mathew Arnold, "the idea is everything, the rest is a world of illusion." "Poetry attaches its motion to the idea, the idea is the fact. Poetry is the criticism of life."

"Poetry is the record of the best and happiest minds." It is, as it were, the interpenetration of a diviner nature through our own but "the footsteps are like those of a wind over the sea which the coming calm erases and whose traces remain only as on the wrinkled sands which paves it."

Poetry makes immortal all that is best and most beautiful in the world. It acts as a solace and comfort in the trials and afflictions of life. It turns all things to loveliness; it exalts the beauty of that which is most beautiful and adds beauty to that which is most deformed. "It marries exultation and horror, grief and pleasure, eternity and change." It subdues to union "under its light yoke" all irreconcilable things. It transmutes all that it touches.

The functions of poetical faculty are two fold: by one it creates new materials of knowledge, power and pleasure; by the other "it engenders in the mind a desire to reproduce and arrange them according to certain rhythm and odour which may be called the beautiful and good." The cultivation of poetry is never more to be desired than

at periods when, "from an excess of selfish and calculating principle, the accumulating of the materials of external life exceed the quantity of the power of assimilating them to the internal laws of human nature" "Poetry", says Carlyle, "is musical thought." "A vein of poetry exists in the hearts of all men. It is a man's sincerity and depth of vision that makes him a poet."

But, from the practical point of view, we must say that, prose is the blood, the cornerstone of language and poetry its flesh and beauty. As we have already observed, prose is the brick and mortar, poetry being the finer works in the great edifice, language. Poetry is one of the fine arts, like music painting etc. and is the fertile source of our intellectual happiness. It elevates and invigorates the mind when we are depressed or when we become the willing captives of Melancholy. Sentiment is the ruling passion in poetry; it liberalises the mind, enlarges, enlightens and spreads a spell of rapture over our sorrows and distresses. "Poetry was given to us to hide the little discords of life and to make man contented with the world and his condition."

If poetry can in some degree invade the domain of prose, so, on the other hand prose can at times invade the domain of poetry. Undoubtedly the prose of Plato, that may rightly be called poetical prose, is a legitimate form of art. "Poetry, the earliest form of all pure literature is also the final and ideal form of all pure literature". With regard to the relation of poetry to prose, Coleridge once asserted that the real antithesis of poetry was not prose but science.

Thus, it is clear that prose and poetry are, more or less, the two great essential elements having their own special characteristics and special uses and both are fruitful channels that fertilise one common land, language.

JATINDRANATH MUNSHI.

A tribute to Sir Walter Scott.

Behold, the martial poet strings
A floral garland from the lea;—
Thro' every buxom heart he brings
A thrilling joy and symphony.
The lays of knights, the lays of kings,
The lays of long-lost lovers' glee,
The Border minstrel lightly sings
The lays of ancient chivalry.

Suryya Kumar Bhuyan,

3rd year B. A. Class.

Presidency College, Calcutta.



CRICKET.

English Schools vs. Indian Schools.

This annual fixture commenced at the Calcutta Eden Gardens on Saturday afternoon the 5th inst. and was concluded Sunday, when the local representatives of the English Public Schools recorded their sixth victory (out of seven seasons) over the Indian Schools team, by the narrow margin of fifteen runs. The ground fielding on either side left much to be desired. Both sides had got together a strong combination and a very keen struggle was anticipated.

Full scores are :—

ENGLISH SCHOOLS—1ST INNINGS.

B. A. White, b Baloo	... 20
R. N. Bocquet, c Mehta, b Baloo	... 20
A. J. Carter, b Sampre	... 1
G. Turnbull, b Sampre	... 11
F. N. C. Rossiter, b Sampre	... 57
J. D. Guise, b Baloo	... 38
R. C. Cumberlege, c Quiterio, b Baloo	... 25
M. R. Quin, b Marsden	... 13
L. J. Lightfoot, not out	... 11
A. C. Von Ernsthausen, b Marsden	... 10
C. S. Murray, c Mehta, b Marsden	... 0
Extras	... 18
Total	... 224

ENGLISH SCHOOLS—2ND INNINGS.

C. S. Murray, c Mehta, b Baloo	... 14
L. J. Lightfoot, b Mc Cready	... 25
M. R. Quin, st. Mehta, b Baloo	... 2
J. D. Guise, b Baloo	... 2
F. W. C. Rossiter, b Baloo	... 4
G. Turnbull, c Roy, b Baloo	... 7
B. C. Cumberlege, not out	... 1
Rest did not bat.	
Extras	... 6
*Total (for 6 wks)	... 63

*Innings declared.

INDIAN SCHOOLS—1ST INNINGS.

A McCready, c Lightfoot, b Ernsthausen	... 42
G Banerjee, b Murray	... 4
N Ali, c Turnbull, b Marray	... 12

C Barlow, l-b-w b Ernsthausen	... 25
K Roy, b Lightfoot	... 2
M Quiterio, b Ernsthausen,	... 5
H R Mehta, c Ernsthausen, b Lightfoot	... 46
C. M Ali, not out	... 55
P. Baloo, c Lightfoot, b Ernsthausen	... 0
D Sampre b White	... 1
C Marsden, b White	... 2
Extras	... 15
Total	... 209

INDIAN SCHOOLS.—2ND INNINGS.

K Roy, c Carter, b Bocquet	... 0
M Quiterio, c Lightfoot, b Guise	... 22
N Ali, not out	... 34
A McCready, c and b Guise	... 15
H. R Mehta, not out	... 5
Total (for 3 wks)	... 76

Rest did not bat.

NRIPENDA NARAYAN PRIZE—As previously announced Messrs. S. Ray and Co. will award the above prize on the result of the batting of the cricket season 1911-12. Secretaries of first class clubs are requested to send to Mr. D. Sen, c/o S. Ray and Co., 11/1, Esplanade, the name of the best batsman of their respective clubs with the details of his innings for the season.

Lansdowne Shield : Final.

PRESIDENCY COLLEGE VS. MEDICAL COLLEGE (CIVIL)

This two-day's fixture was concluded on the Presidency College ground on Wednesday when the home team won by the substantial margin of four wickets and 20 runs. Scores :—

Medical College

1st Innings	57
2nd innings	142

Presidency College

1st Innings	126
2nd Innings (6 wks,)	93

FOOTBALL TOURNAMENT AT MADRAS.

Before a large gathering of spectators the final on the 17th. inst. in the Association Football Tournament was played between the 2nd Leicester Regiment and the Queens Own Cameron Highlanders. The former were the cup-holders, and great interest was manifested in the game which was a splendid one. Both sides played for all they were worth, and half-time came with no score. On resuming, the Camerons exhibited better staying powers, and towards the close the wildest excite

ment prevailed as the result of a corner obtained by the Camerons, but nothing came of it or of two more corners which followed to the credit of the Camerons in quick succession. Just before the close of play they secured a goal amidst tremendous applause. Brigadier-General Bond congratulated the winners, and Lady Hammick presented the cup.

SPORTS.

Bengal Presidency Sports.

The nineteenth Championship meeting of the Bengal Presidency Athletic Association took place on the Calcutta cricket field, Eden Gardens, on the 17th. inst. and was largely attended. The programme was a very long one, comprising no fewer than 26 events, but they were got through in good time, and though there was a little delay between some of the events, it was nothing to complain of.

The various events were very keenly contested, and in several of them new records were set up. There was a surprise in the first race for the hundred yards Presidency Championship, the holder R. H. Leadon, of the Y. M. C. A., being defeated by A. J. Duffy (not A. F. Duffy, the Leicester flyer!) of Dacca, after a fine race. Duffy's time was $10\frac{1}{8}$ secs. a fifth of a second longer than Leadon's last year. Duffy also beat Leadon in the 220 yards Amateur Championship, but here again the time was slower than that in which Leadon won a year ago.

Dr. Roberts, of the 2nd King's Regiment, Lahore won the 100 yards (in record time 2m. $19\frac{1}{8}$ secs.) and the Mile British Army Championship, being followed home in each event by Private Mahoney, an ungainly runner who nevertheless gets over the ground. Sergt. Miller of the Royal Irish Rifles, had a remarkable run of successes, winning the 100 yards, 600 yards (which he did in 1 m. $15\frac{1}{8}$ secs., a second better than the Indian Army record, which has stood since 1906) and the 440 yards.

In the Native Army Championships, the 93rd Burmas carried everything before them. All three prizes in the 100 yards fell to men from that Regiment, the first two in the half mile, and all three in the quarter mile. Naik Iman Din won two first prizes.

At the conclusion of the Sports the prizes were presented by Lady Jenkins.

The C. E. College Sibpore Athletic Sports was held on the 21st February 1912.

The Muir Central College (Allahabad) Sports took place on the 13th and 14th inst.

SCIENCE NOTES AND OTHER INTERESTING MATTERS.

The New York women teachers own the battle of "equal pay for equal work," and Grace Strachan, leader in the fight, is the heroine of the day. But it is of other things that we would write now. In any educational system primary education is of perhaps the highest importance. Its quality depends on the manner in which time is allotted, and the use made of the allotted time. Boston has been looking into its educational efficiency, and publishes a table to show how, in the elementary schools, time is distributed among the various subjects of instruction:—

	GRADES.										Total Minutes per week.
	I	II	III	IV	V	VI	VII	VIII			
Arithmetic	25...	210...	210...	270...	270...	230...	210...	210...	1,635		
Drawing	100...	95...	90...	90...	90...	90...	90...	90...	735		
Elementary Science	30...	30...	30...	45...	45...	45...	45...	60...	330		
Geography	—	—	—	150...	150...	150...	150...	90...	690		
History	—	—	—	30...	30...	120...	120...	150...	450		
Manual Training or Household Science	—	30...	30...	120...	120...	120...	120...	120...	660		
Music	60...	60...	60...	60...	60...	60...	60...	60...	480		
Opening Exercises	60...	60...	60...	30...	30...	30...	30...	30...	330		
Physical Training	60...	90...	90...	80...	80...	80...	80...	80...	640		
Physiology and Hygiene	—	—	30...	30...	30...	30...	60...	60...	240		
Intervals	100...	200...	200...	100...	100...	100...	100...	100...	1,100		
Reading and Literature	735...	480...	455...	190...	190...	165...	150...	195...	2,560		
Spoken and Written English	230...	245...	245...	305...	305...	280...	285...	255...	2,150		
Totals	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	12,000		

A Belgian mining engineer, Mr. Walteyne, has devised a method of dealing with colliery explosions which is extremely novel, and is said to have been successful. On a plank across the gallery is placed a quantity of some incombustible powder, that is one which contains no carbon. The result is that at the moment of explosion, the incombustible

A New
Invention

tible powder falls and forms a dense incombustible cloud which cools the gas and constitutes a medium in which the flame cannot be propagated partly owing to its inertia and partly by prolonging the contact of the gas with the walls of the gallery.

— — —
A most fascinating lecture was given at the Royal Societies Club, St. James's Street by

Musical
Sands

Mr. Cecil Carus-Wilson, on the subject of "Secret in Sands," and a part of the lecture was devoted to a consideration of the extraordinary sands known as "musical" or "singing" sands.

The best singing sands in the world come from the Isle of Egg, off the coast of Scotland and it is comforting to know that whatever figure Britain may cut in grand opera, she is at least pre-eminent when it comes to a question of singing sand. But what is singing sand? Mr. Carus-Wilson went to great pains to leave no doubt on the subject, and although his audience contained many eminent geologists he asked leave to begin at the

very beginning and to treat his audience "as an audience of boys."

By means of a splendid series of lantern slides the lecturer showed how the rocks, of which the earth is composed, are decomposed by the action of natural causes, chiefly the weather: how cliffs become boulders, how boulders become pebbles, and pebbles in turn become sand.

In course of time it occurs that Nature, that most versatile old lady, produces a kind of sand which has music in its soul: a sand composed of quartz, rounded and highly polished, of a uniform size and very clean. And when these are agitated so as to produce vibrations, by means of the wind, by being trodden upon or by being struck, they produce musical notes. Such perfect deposits are found in the Isle of Egg, and it was by means of samples of the real Egg variety that the lecturer produced musical notes before his delighted audience, who forgot that they knew a lot about geology and other scientific subjects, and cheerfully behaved as boys.

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NOTES ON

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BUSINESS NOTICES.

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Vol. 1 THE COLLEGIAN No. 11
An All-India Journal of Education.

CALCUTTA, SATURDAY 23RD MARCH, 1912

At the last Bengal Literary Conference held at Chinsurah in the first week of March Professor Benoy Kumar Sarkar M.A. of the Bengal and Religious National College, Calcutta read a very thoughtful and instructive paper on Religious Education. It was an eloquent performance and was warmly appreciated.

In Education as in Industry, Professor Sarkar is an advocate of the domestic System as opposed to the Factory System and made out his case for it in a most consistent and scientific way. In the course of his arguments he gave an account of the nature and method of Religious education prevalent in Europe and America, criticised western pedagogic ideals and philosophy of life and discussed such problems as the antagonism between culture and faith and the rivalry of denominations. His conclusion is that what passes for religious education in the western Universities is only a part of Historical and philosophical instruction and that real spiritual culture can not be promoted in educational institutions of the type known in Europe and America. He discussed the claims of the day school, boarding school, residential system, and Teaching Universities and finds that these can never have the atmosphere and Environment for the 'education' of the heavenward instincts of the soul. Spiritual Education worth the name can be promoted only under conditions of personal love and responsibility that were supplied in the homes of Preceptors in Ancient India. The Professor gives a graphic and glorious account of the Hindu pedagogic system that has produced through the ages a continuous race of men and women—Panini, Chandragupta, Vasistha, Maitreyi, Ramprasad, Rani Bhavani, Sivaji and Ramkrishna—who may be ranked among the greatest of world's thinkers and actors. He concludes by pointing

out the message and mission of modern India to humanity.

The close logic and philosophic treatment of the subject matter make the paper a masterpiece of Bengali literature. The Professor combines gracefulness of style with loftiness of thought, ease of flow with simplicity of diction. Above all there are a seriousness and sincerity, a high moral tone and warmth of feeling that characterise all his works. The Paper is full of suggestions and should be carefully read by those who are responsible for the education of boys and girls.

Professor Samaddar of Hazaribagh and A.F.M. Abdur Ali of Rungpore, are, we understand to be invited to the International Congress of Historians to be held in London in the summer of 1913. Both these gentlemen are Fellows of the Royal Historical Society of London.

The degree examinations of the Allahabad University are approaching very near. A great agitation is prevailing among the examinees, as plague is prevailing in Allahabad in almost every quarter. Seven students of the Kayastha Pathshala have died of plague. On Tuesday the 12th instant a deputation of about 100 examinees of Allahabad waited on the Hon. Vice-Chancellor with a prayer for the post-ponement of the examination. Agra College and St. John's College have also sent application for the same. The Vice-Chancellor has promised to consider the case.

Allahabad
University
Exams.

SITUATION VACANT

WANTED immediately for the Sri Partap College, Srinagar, Kashmir, a Professor of English and a Professor of Mathematics, with high qualifications and competent to teach up to B. A. classes. Salary Rs. 200-25-250.

Applications stating age, with attested copies of testimonials (which will not be returned) should be submitted to the Minister of Education Jammu and Kashmir State, Jammu, not later than 15th March 1912.

Selected candidates only will receive reply.

By order
R. P. Pande, Secretary
to Minister of Education Jammu and
Kashmir State.



CALCUTTA UNIVERSITY

A convocation at the Calcutta University is always a picturesque and interesting function. The great hall of the University, crowded from one end to the other with graduates, wearing with justifiable pride, the robes to which their scholastic attainments of the past year have entitled them, while on the platform were His Excellency the Chancellor in his gold-embroidered robes, the members of the Syndicate, Fellows and learned Professors of the University in academic costume of many colours. As the graduates came up in batches to receive their degrees at the hands of the Vice-Chancellor, the scene in the hall becomes an animated one and one not soon to be forgotten. This year there were no fewer than 1469 graduates, including seventeen ladies—five Anglo-Indians and twelve Indians—twelve of who had qualified for B. A. degree, three for L.M.S. degree and two for the B. T. (Bachelor of Teaching.)

His Excellency the Chancellor arrived at the Senate House at 2-45 and was received by His Honour The Rector (Sir William Duke), the Hon. the Vice-Chancellor (Sir Ashutosh Mookerjee), the members of the Syndicate and the Registrar (Dr. Thibaut). After Lord Hardinge had assumed his robe, he was escorted in procession down the centre of the overcrowded hall to the platform. First came the Registrar and the members of the Syndicate, then His Excellency,

Annual
Convocation
March 16, 1912

accompanied by his A.-D.-C's and followed by His Honour the Rector and the Hon. the Vice-Chancellor, the ex-officio fellows, Honorary Fellows and ordinary Fellows, His Excellency and the Vice-chancellor occupied State chairs in the centre of the platform, with Sir William Duke on the right.

Amongst others on the dais were Sir Gooroo Dass Banerjee, ex-Vice Chancellor, the Hon. Babu Devaprasad Sarvadhikari, the Maharaja of Durbhanga, the Maharaja of Cossimbazar, Sir Robert Carlyle, Sir Harcourt Butler, the Hon. Mr. Ali Imam, and the Hon. Mr. G. W. Kuchler (Director of Public Instruction, Bengal).

Her Excellency Lady Hardinge occupied a seat facing the dais.

His Excellency having declared the convocation open, the recipients of Honorary Degrees were introduced by the Vice Chancellor and received their degrees from Lord Hardinge. They were Lieutenant-Colonel Douglas Craven Phillot, Doctor of Philosophy; Professor Paul Johannes Bruhl, Doctor of Science; Professor Jagadis Chandra Bose, Doctor of Science.

The ceremony of presenting the ordinary degrees was as might be expected a lengthy one. There were as has been said, 1,469 graduates, but many of them qualified at Colleges out of Calcutta, and only about 600 attended to receive their degrees in person. Despite this, and despite the fact that the graduates were brought up in batches, the presentation of degrees to them occupied about an hour and a half. The lady graduates were loudly applauded as they stepped up to receive their degrees.

The figures on the different degrees were :— Ph. D., 1; M. A., 136; B. A., 633; M. Sc., 21; B. Sc., 139; B. T., 27; M. L., 2; B. L., 425; D. P. II., 1; M. B., 7; L. M. S., 64; and B. E., 13; total, 1,469.

MADRAS UNIVERSITY

Mr. G. A. Natesan has given notice of his intention to move the following proposition :—“That a Committee be appointed by the Senate to consider and report at its next meeting upon the practicability or otherwise of the institution of degree in Commerce and Agriculture in the University of Madras : and that the Committee, be requested, should it find the proposal practicable, to submit with the Report a suitable scheme of studies and such further details in the form of Regulations, etc., as may be necessary to give effect thereto”. Should the above motion be adopted, I shall propose : ‘That the Senate do proceed to appoint the Committee’.

ALLAHABAD UNIVERSITY.

The following additions to, and changes in, various Chapters of the University Regulations have been sanctioned :—

That in Chapter XIV, section 1, after sub-section (iii), the following should be added :—

“Provided in every case, that the candidate shall complete his eighteenth year on or before the day fixed for the commencement of the examination.”

That in Chapter XV and Chapter XVIII, section 1, after sub-section (iii), and section 1, after sub-section (ii), respectively, the following should be added :—

“Provided in every case, that the candidate shall complete his twentieth year on or before the day fixed for the commencement of the examination.”

That in Chapter XVI, after section (2) and Chapter XIX, after section (2), the following should be added :—

“Provided in every case, that the candidate shall complete his twenty-first year on or before the day fixed for the commencement of the examination.”

That to Chapter XVIII, 1 (i), there be added :—

“or after passing the Intermediate Examination of University of Calcutta, the Punjab, Bombay or Madras with the subjects Physics, Chemistry and Mathematics or Physics, Chemistry and Biology (Natural Science).”

To be added at the end of the first section of regulation 2, Chapter XIV of the University Regulations :—

“and that in the case of inspecting officers, school-masters and demonstrators serving in an affiliated college, the period of *continuous* service shall have been not less than eighteen months from the date on which they entered such service.”

The following to be added at the end of the concluding portion of regulation 2, Chapter XV of the University Regulations :—

“and that they shall have served *continuously* for not less than eighteen months from the date on which they entered such service.”

Regulations 3 and 4 of Chapter XXI to read as follows :—

“3. Every candidate shall be required to have passed through a practical course of physical training, and shall further, in the presence of at least two Examiners appointed by the Board of Examiners, give satisfactory evidence of ability to manage a class. He shall give two lessons on subjects embraced in the curriculum of high schools, one of which at least shall be on the

English Language. The candidates shall receive due notice of the subjects in which they will be asked to give a lesson.

Candidates who desire to offer evidence of special fitness for teaching one or more branches of high school curriculum, may submit their names for special examination in the same. An indication of the special qualifications for teaching one or more such branches will be given in the diploma of successful candidates. In the case of a candidate who presents himself for special examination in English, History and Geography, Mathematics or Classical Languages, the second lesson delivered before the Examiners shall be on one of these subjects offered by him. The fitness of a candidate for special distinction in Science or Manual Training shall be tested by an examination of the records made or practical work done by him during his period of training.

The examination in the practice of teaching shall be conducted at the Training College at which the student was trained, and the Examiner shall also take into consideration the record that has been kept at the College of the work done by the student during the course of training."

"4. Candidates who fail in the examination in the Theory of Teaching, may present themselves for re-examination therein at a subsequent examination, without attending a further course at a college affiliated in the branch of Teaching, provided that they produce satisfactory evidence that in the interim, they have been teaching in a recognised institution."



and Schools.

Major Clemesha I. M. S. Sanitary Commissioner to the Government of Bengal delivered a course of very interesting lectures to the Engineer Students of the College on the "Disposal of Sewage". from the Sanitary Engineering point of view.

Civil
Engineering
College
Sibpur

The Examinations of the Joint Technical Examination board (Overseer and Sub-overseer examinations) are now over. The Board examines the Apprentice Department of Sibpur College, the Behar School of Engineering and the Dacca School of Engineering.

Professor Moazzam Ali B. A. (Oxon) Bar-at-Law of the Patna College takes leave and joins the Dacca Law College as its Vice-Principal *vice* Mr. S. Khuda

Government
Law College
Patna

Bux on leave.

The Students of the B. N. College have subscribed Rs. 150 to the Hindu University Fund. Credit is due to Professor S. Dayal, who approached every student to contribute his mite to the great educational organization of Pandit Madan Mohan Malaviya.

Daulatpore
Hindu
Academy
Khulna

The Maharaja of Cossimbazar visited the Daulatpore College on the 1st instant. Prominent members of Khulna Bar were present to receive the Maharaja.

The Maharaja expressed his satisfaction at everything he saw. He gave Rs. 250 to the students for entertainment. With his usual generosity and his keen interest in educational matters the Maharaja made a donation Rs. 5000 to the College.

Pandit Syamacharan Chakravarti, M.A., has been appointed lecturer in Sanskrit *vice* Pandit Ramlal Kanjilal, M.A., who has left us for Kashmere. The former has not, however, arrived yet. Professor Haridas Bagchi, M.A., P. R. S. has won the Ph. D. degree by his researches in Mathematics. He is the youngest man to have received this highest distinction at the disposal of the Calcutta University. He is now enjoying two months' leave at Calcutta. We longingly look forward to the time when this distinguished and unassuming scholar will be back in our midst in about a month's time. The University Inspectors Dr. P. K. Ray and Mr. J.

The Cotton
College
Gauhati

N. Dasgupta were here sometime ago. While they were here, a special meeting of the Assamese Students' Literary Club was held to commemorate the anniversary of the late Mr. Anandaram Baruah, B. Sc., I. C. S., Bar-at Law, who is well-known to the Sanskritists all over the world for his literary works. Dr. P. K. Ray remarked from his presidential chair that the then Registrar of the the London University, Dr. Carpenter, had once said to him (Dr. Ray) that Anandaram Baruah was the most acquisitive student that Dr. Carpenter had ever seen. Dr. Ray urged upon the students the necessity of daily physical exercises. He especially recommended the Indian Club for the purpose. He requested the staff, the students and public to bestir themselves for the physical well being of the students and to do all in their power for having a Gymnastic teacher and a properly equipped gymnasium.

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On Friday the 1st of March His Excellency the Governor visited the college at about 4.50 P.M. Messrs M. Mathu Iyer, the Secretary of the College board and S. Venkobachariar, the Principal of the College met H.E. at the gate and conducted him to the various classes and laboratories.

Madura
College

On this occasion H. E. opened the gas fitting of the Physical Science laboratory. Next, H. E. was taken to the Drawing hall. H. E. was very much pleased to see young boys of 8 and 10 at their model drawing and of the works of the students of the Senior department in oil and water color painting and chalk drawing. Thence H. E. proceeded to the Natural Science laboratory, where the museum attracted his attention and above all the spider collections and observations made on them by Mr. N. S. Jambunathan B.A. L.T.F.Z.S.—Sub. Asst. Inspector of schools—who had been present there on the occasion. The observations about the various species of spiders of South India were explained to H. E. by him which quite pleased him. Next H. E. was taken to the upper hall. Some Sanskrit slokas praying for the long life of King Emperor and H. E. were sung in honour of the occasion. Mr. S.

Venkobachariar while thanking H. E. for his visit made a short speech about the efficiency of the college and of the other institutions connected with the same. H. E. then expressed his heart-felt thanks to the Principal for the warm reception given him and requested for a holiday in honour of his visit for the boys.

The Zemindar of Peddakimidy has promised the college a donation Rs. 10,000 for the construction of a new hostel for Uriya students to be called George V. Coronation Hostel.

Kalicota
College
Berhampur

The "Central College Day" was celebrated on the 16th March. The previous evening there was in honour of the coming occasion, a football-match between the past and the present boys of the college, which the latter won together with the generous Principal's Medals. The old boys came in numbers in the afternoon. After a few games at Tennis and Badminton, and amusing science demonstrations, they were treated to tea. At 5 P.M. all assembled in the spacious hall of the Physics building. Mr. Visveswaraya C. I. E. presided. He spoke at length among other things of the growing need for practical and moral education. The Principal Mr. J. G. Tait thanked the Chairman and the enthusiastic alumni, and the "Day" came to a close with lusty cheers to His Highness the Maharaja of Mysore.

On Saturday the 9th of March a public lecture was delivered by Mr. B. J. Vaishnava, Deputy Educational Inspector Baroda State on "Some thoughts on Narsinh Mehta" before a large gathering of the students of the Bahauddin College Junagadh and some visitors from outside in the College hall at 5/30 P.M. The occasion was presided over by Prof. M. M. Joshi. The lecturer after making a few introductory remarks began with a brief sketch of Narsinh Mehta's life which is so full of miracles and is so exemplary from the

Bahauddin
College
Junagadh

view-point of true devotion. Then he touched but lightly upon a few of the poet devote's Padas Bhajanas etc. which gave expression more to the outbursts of true devotion, sympathy and fellowfeeling than to the manifestations of a true poetic art and concluded by explaining how easily the life of a man of mediocre abilities can achieve its purpose if he were to walk in the footsteps of Narsinh Mehta. The president then spoke at a great length on the moral and spiritual aspect of his life and shewed how important the qualities—sincerity of purpose, faith in the future, perseverance and the choice of a noble aim were to make our life a success.

On the motion of Mr. Ranabhai a vote of of thanks was accorded to the chairman and the lecturer, and the meeting dispersed at 8 P. M.

The annual prize distribution of the Agra College took place on Wednesday after noon the 21st February 1912. All the Professors appeared in their academical costumes of various universities, both Indian and English, and all the students were in their uniform head-dress of light blue colour. Cups and other trophies, which the college has won at sports were exhibited. Mr. Reynold the Commissioner of Agra Division was in the chair. The Principal read the Annual Report and showed in the course of his Report that the object of the pious founder Gangadhar Shastri was meritoriously fulfilled in respect of the university results, particularly at the past Examinations, when the number of pass was 70 per cent. The traditions of the old college which is only second to Queen's College Benares in antiquity, being founded in 1818, have been assiduously maintained. After giving the prizes, presenting medals and distributing university certificates, the Commissioner spoke in high terms of the progress of the College and congratulated the staff and the students on their hearty co-operation, both in class room and the play ground, which invariably results in something good. The trial scene from Shakespear's Merchant of Venice was enacted at

at the end of these proceedings. The performance though short was a bright one, which was due to Professor T. F. O'Donnell's hard labour in instructing the boys.

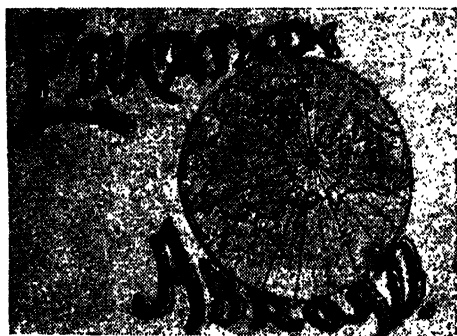
After this the meeting dispersed with cheers for the commissioner, the staff and the actors.

On Friday the 23rd February an interesting lecture on religious subject was delivered by Professor H. C. Sarkar M. A., (Manchester) in the College hall. Mr. T. F. O'Donnell Esq., was in the chair. In his lecture Mr. Sarkar denounced with great vehemance the forms and ceremonies that have come to be regarded as a part of religion. He said that scripture and prophetic guidance might be used as auxiliary to the religion, but should not on any account be made religion itself. The dogmatic truths, he urged, might be tempered with reason or else it will be sheer nonsense. He pleaded that essence of religions was to obtain communion with God, to be one with God. He emphasised upon the point that just as the prophets and Rishis of old are said to have had inspirations and revelations from God the same might be attained by every man and that no sensible man should rest satisfied with any thing short of that. He urged that every one should believe in God, because he felt his presence in the heart of hearts and because he realised the spirit of spirits, God in his innermost cell of soul.

The president endorsed every statement of the learned lecturer and laid great stress upon realising God in spirit rather than worship Him with rites and ceremonies.

The lecture was arranged by Professor Nilmoni Dhar, B.A. B.L., who is an ardent member of the Brahmo Samaj.

The late Rai Bahadur Mata Pershad of Farrukabad has left by his will Rs 1000 for a scholarship to a poor Kayastha student of Agra College. He has also donated a fair amount to the Central Hindu College Benares, for the same purpose. The late Rai Bahadur used to take great interest in the educational affairs specially in Agra College.



Tuesday, July 2.—Morning.—Chairman, Lord Rosebery, Chancellor of the Universities of London and Glasgow, and Lord Rector of the University of St. Andrews. Subjects: (1) Question of specialization among Universities; (2) Inter-University arrangement for post-graduate and research students.

Wednesday, July 3.—Morning.—Chairman, Lord Curzon of Kedleston, Chancellor of the University of Oxford. Subjects: (1) The relation of Universities to technical and professional education and to education for the public services; (2) Interchange of University teachers. Afternoon.—Chairman, not yet fixed. Subject: The problem of the Universities in the East in regard to their influence on character and moral ideals.

Thursday, July 4.—Morning.—Chairman, Lord Rayleigh, Chancellor of the University of Cambridge. Subjects: (1) Conditions of entrance to Universities and the mutual recognition of entrance tests; (2) Action of Universities in relation to the after-careers of their students. Afternoon.—Chairman, Lord Haldane, Chancellor of the University of Bristol. Subject: University Extension and tutorial class work.

Friday, July 5.—Morning.—Chairman, Lord Strathcona, Chancellor of the Universities of Aberdeen and McGill. Subjects: (1) The establishment of a Central University Bureau—its constitution and functions; (2) The position of women in Universities.

For the first time the fifty-two Universities of the Empire will meet in council, each University

represented by accredited delegates and at six sittings, each presided over by a chairman of the highest eminence, will confer on a matter of the first importance to the solidarity and welfare of the Empire.

We are not forgetting the Conference of Allied Colonial Universities organized by Sir Gilbert Parker in 1903, or the two more recent Conferences on Education as a whole, called respectively by the League of the Empire and the Board of Education, but the first of them sat for a single day, and at the other two University questions were hardly touched upon.

The Agenda prefixed to this article shows how wide a field has to be covered, and it is to be hoped that some of the more pressing questions will be referred to committees. We are glad to learn that when the formal work of the Conference is over the delegates will spend nearly a month in visiting the other Universities of the United Kingdom, and we have no doubt that more will be gained in the way of imparting and receiving knowledge and so providing a mutual understanding by such informal intercourse than could be effected by prolonged sittings.

The Home Universities Committee, which is responsible for the Agenda, consisted of the Vice-Chancellors of all the Home Universities, strengthened by a few experts, and their discretion is shown even more by the subjects that are omitted than by those that are selected. For instance, the relation of the University to the State and of the staff to the governing body are at once too wide and too thorny questions to be admitted. Even among the subjects to be discussed there is room for the widest differences of opinion, and there is no fear of any one debate lapsing for lack of contrary arguments. But there are two or three topics on which there is universal agreement as to the object to be secured, and here we may hope that the Congress will evolve, at least in outline, a plan of common action. One of these is "Conditions of entrance to Universities and the mutual recognition of entrance tests." At home the diversity of entrance tests is a standing grievance with schoolmasters, though of late something

has been done to remedy it; but if a common articulation standard could be secured there can be little doubt that Colonials would send their sons in far greater numbers to a British University.

If the British Universities would agree to admit any student who had passed a year at a colonial University, this would be a distinct step in advance, and it can hardly be contended that the students so admitted would be inferior in mental calibre to natives who now manage to scrape through Responsions. Cognate to this is the question to be debated under Lord Rosebery's chairmanship of post-graduate study. Here there are no difficulties of revising long-standard regulations; but we want the colonies to tell us how it is that for one post-graduate student that our English Universities attract from abroad, the German Universities attract a score. The cause cannot be ascribed solely to the superiority of German professors, for in classical scholarship, in literature, and in some branches of science we can certainly hold our own. The *vera causa* lies in the fact that so far English Universities have not laid themselves out to encourage or provide for the wants of post-graduate students. How many Oxford or Cambridge students stay up for research work or with any other object except a fellowship in prospect?

As to the interchange of University teachers we are less hopeful of arriving at any practicable scheme. English Professors have already been welcomed in the Colonies as *Gaste* and given single lectures or a course of lectures, and Prof. Gilbert Murray has set an example which we hope may be followed, in accepting an invitation to give a whole term's tutorial work at the Ann Arbor University; but to effect an exchange between A and B for a year, or even for a term, would be as hazardous a venture as to arrange a marriage by a matrimonial agency. It may be said generally that it takes a term for the ablest teacher to get into touch with his class and be really effective.

No better Chairman than Lord Strathcona, a born organizer, could be named for the discussion of the penultimate question—the establishment of a Central University Bureau. There is no need to point out the many useful functions that such a bureau might perform—the interchange of University intelligence, official documents, &c., the announcement of vacancies or new posts to be filled, arrangements of lectures by Colonial professors visiting England or English professors visiting Colonies.

We cannot conclude without again expressing our profound regret at the loss which the Conference has sustained in the death of its first secretary Dr. R. D. Roberts. Dr. Alex Hill has stepped into the breach and proved himself a worthy successor, but it will not be forgotten that Dr. Roberts did all the spade work.

The last Imperial Conference on Education was a dull affair, mainly because the Board of education neglected to make any preliminary arrangements for Colonial readers of papers and openers of debate. The organizers of the forth-coming Congress have not fallen into this vital error. Every item on the agenda has been entrusted to some competent authority, home or colonial, and all communications intended for the Congress will be printed before it meets.

We may again remind our readers that associate membership of the Congress will be open to all who may choose to join on payment of a fee of 10s. 6d. (*Journal of education.*)

The offer, previously announced, made by an anonymous gentleman through the London University Items Chancellor to provide at University College at a cost of £30,000 accommodation for the teaching of Architecture, Sculpture, and Eugenes, was gratefully accepted, and Prof. F. M. Simpson, F.R.I.B.A., was appointed Architect for the new buildings.

Provisional recognition was granted to a scheme for the endowment of the teaching of Home Science and Economics in connection with King's College for Women, for which purpose a sum of £50,000 has been promised, the administration of the scheme to be vested in a Special Committee constituted under a Trust Deed.

It was reported that Sir William Ramsay, K. C.B., F.R.S., had submitted his resignation of the Chair of General Chemistry from the end of the current session. It was resolved "that the Senate accept Sir William Ramsay's resignation with sincere regret, and desire to express to him their high appreciation of the services which he has rendered to the University both by his inspiring work as a teacher, and by the great series of researches carried out by him at University College during his tenure of the Chair of Chemistry."

WHAT OUR STUDENTS ARE DOING ABROAD

The following are the marks obtained at the first Semester Examination of the Wisconsin State University of America.

Biren Das Gupta :	Descriptive Geometry	75%.
	Mathematics	80%.
	Mechanics	72%.
	Drawing	85%.
Hemendra Rakshit :	European History	85%.
	Public Finance	71%.
Naren Sen Gupta :	Mathematics	93%.
	Mechanics	90%.
	Drawing	80%.
	Surveying	90%.
	Workshop	80%.

On the influence of Environment.

Common people speak so very commonly about the mysteries of life that a serious thinker rather wonders how much and to what extent these may have been brought home to them. These mysteries have been so often spoken about and so often reiterated that the twentieth century civilised life appears to be almost disenchanted of its mysteries. It may be rather quixotical to assert that the more you dive deep in mysteries, however unfathomable, the less mysterious they appear to be; but doctors and laymen join hands in averring that the more you accustom yourself to poison the less sensible you become of the effect thereof. And if this applies to the domain of the physical, it applies none the less forcibly to the domain of thought. Nature and her revelations exhibit things and phenomena not the less wonderful and amazing to her novitiate than the simple Kaleidoscope to a child. In one the endless diversities, and novelties are the direct counterpart of the everchanging succession of things so very clearly manifested in the other. The apocalypse of Nature may not have any articulate oracle to explain her teachings but these come out in their casual sequence as surely as anything else. To the common people Nature is only a Kaleidoscope but to men initiated into her study and buoyant with her moral, she is a significant Kaleidoscope. Mere wonder may fix the mind of one, but the mind of the other would not merely be wonder-struck but would also on the contrary be deeply impressed with the *significance* and draw from that source such a fund of generalisations as would with advantage be immediately applied to the amelioration of his surroundings. Organised structures on the surface of the earth afford very good examples. Though late in the day men are now quite agreed among themselves to extend their hands to the scientists and hold with them against the Doctrine of the Immutability of species. Even so late as in the last century the cry was for creation, Designed Creation, Individual Creation, Specific Creation in short creation designed and specific on all sides

run riot. The devout Agassiz was rather disappointed to see the Doctrine of the Origin of Species set out in such clear relief as to make him bend his stiff theological conviction before the bar of scientific evidence. But now the old theory is gone—gone to make room for the newer and a still more promising and harmonising one. For while the older belief in the Immutability of species left scientists groping hopelessly in the dark about finding a correlation between things organic and inorganic and compelled them to hear with mute reluctance all the big scholastic talk about the purpose of creation and the subordination of all nature, living and nonliving, to the demands of man, the sole arbiter of creation, the newer theory of the origin of species has raised a *detent* from the path of the scientific enquirer and has let flow a flood of light on the time and abiding relation that binds the whole diversified creation into a harmonious unity. The belief that once had so very strong a hold on man's mind as to make him think himself the one object, manufactured from the sacred rib-bone of a beneficent Omnipotence, to which the rest of creation is subject to irredeemable subserviency, has now been thrown out of the window with common consent. And there have come through that window the first rays of that knowledge, still kept far away from common cognisance, that promise in no distant time to develop into a radiant orb that pulsating through the Intelligence of men would enable them to see in Nature a pervading principle of harmony and correlation and unity, inspite of the many diversities into which she seems to be differentiated.

The real crux of the newer theory is that the existence of Things is dependent upon, defined and determined by their environment. Time and space are the real and everlasting factors that dictate disposition to material objects. It is a mere question of Equilibrium. One thing exists conditioned by the existence of a myriad of others. The question of existence, the question of life is that of finding out the resultant integral of thousands of forces, each working in its turn in thousands of directions. Had our mechanical and

calculating faculties been infinitely developed, the solution of all questions cosmic, whether physical or vital could have been obtained by solving a titanic simultaneous equation containing an infinite member of unknown quantities. The march of our knowledge is merely attempts, half inchoate, half realised, of eliminating these unknown quantities, and the more we progress intellectually the more we eliminate mechanically and the less difficult the solution becomes.

This constructive influence of environment has now been brought under the pale of Experimental Science, and practical demonstrations of the effect of such a very wide and universal agency on organised structures have been rendered possible. Take for example the case of crystals. A drop of water left on a glass pane exposed to the influence of chilly winter wind will condense into a structure which apart from its architectural beauty affords us a tangible proof of the force of Environment. It is the sudden change of environment that conjures up in it those forces so long locked up, the full working expression of which we find in the definite geometrical shape. Successive changes of environment will induce successive changes in the shape of the crystal. Dimorphism and Polymorphism are common phenomena in the crystal world. In the simpler inorganic world the cases of Sulphur, Carbon and Phosphorous are instructive. The crystalline form of these elements is so far dependent upon temperature that only one crystalline form corresponds to a definite range of temperature—above and below which the crystalline structure is different. Now if Environment can have so very potent an influence on the ultimate particles of inorganic matter how much more potent will it be in the case of organic living bodies! For a little close consideration will tell us that organic life is but one form of aggrandised crystallisation though to fall in with this idea will require the most stringent taxation on our brain power. We have to remember that in the case of the crystal the forces that are at work are comparatively only a few and such as can be in most cases exhaustively dealt with by our physicist or mathematician.

But in living bodies the underlying dominant current of force is resolvable into so many elementary ones too complex for their number and nature to be effectively comprehended by us, that even progressive scientists have sometimes to take shelter under vague expressions like vital force, vital energy. But however great the complexity, however deficient the nomenclature in perspicuity, the fact stands patent that environmental forces are at the root of all these multifarious exhibitions of Forms and Phenomena that are indissolubly linked up with existence.

This is very clearly borne out by the vegetation of our ponds and marshy bogs. The lotus and water lilies our common water plants will defy all attempts to grow them upon a dry soil. Living as they do under water they have to contend enormously against the conditions that are most disagreeable and unfavourable to plants in general. But now that they have acquired a firm footing in the muddy soil of pools and ponds and having fought a silent though an ardent fight with their environment, have at last come to harmonise their structure in response thereof, they will modestly refuse all advances made to them in the way of a new, free and unburdened lease of a soil on land with due thanks. Time was when they struggled hard against those gaunt species of Plants that grow on land—hard with all the native tenacity of their life, but nothing under the heavens helped them to maintain the struggle and eventually they have been pushed to the water and thus cornered. They have built up at last a rather permanent home in water but consider the difficulties in their way that they had to face before they could adapt themselves to the element to live where has been most unwillingly thrust upon them. Tracing their descent from the Dicot of unknown and hoary memory they should in all reason have a structure similar to that of their fellows on land. But instead they have had to form an elaborate system of canals—cavities to maintain a supply of gas for nutrition. They have now been fated never or seldom to produce branches—they have to bear the full weight of necessitous big and heavy leaves which must be

kept afloat to catch what rays of the sun they best can. The infinitely large number of tiny azure leaves dangling in the air and sporting with sunshine found as characteristic features in their relative on land are not for them to breed and develop—they, poor delicate creatures of the water must rest content with the production of a few large leaves kept constantly swaying by the rude force of currents of water and must spend up all their valued energy towards the development of tediously long, unsightly, almost useless ropes of Petioles. The Fibrovascular bundles—the water conducting elements in plants—always disposed centrifugally in land Dicots, have to be moved inwards towards the centre. The mechanical tissue—the Hypodermis, sclerenchyma, the lignification of wood cells, generally the prerogative of land Dicots to enjoy, have been denied to them or if not entirely so, are given with scant liberality—and instead they have got only succulent, thin-walled turgid cells, some shaped in the form of irregular stars (stellate cells) to support their structure. Transpiration, such a very pleasant and active function in land plants and a riddle to scientists and laymen alike, has been considerably reduced in their case and consequently food materials have to be obtained by the rather slow process of osmosis from the surrounding medium. The cuticle is never developed and stomata are almost wanting from the submerged parts though scattered well enough only on the upper surface of the floating leaves. The whole stem of the plant has been stunted into either a miserably trailing Rhizome or an elongated Tuber. The Rootsystem is but poorly developed and stands a mocking caricature before a normally developed Dicot Root.

And all this for environment. The aquatic plant in accommodating itself to its new habitat has undergone such a very radical transformation—structural and functional—that it sets the importance of the superb play of environment in bold relief and it is for us to draw the significance therefrom. For the stately grandeur of high and columnar stems would afford little ground for envy to it. Being compelled to live in water, it

has necessarily no need to exhaust its energies for the formation of a complex rootsystem for it has water and nutrient solution enough for the asking ; and struggling hard to maintain its hold on the substratum it must of necessity trail on the ground muddy and clammy though it be. And shut up from all light from above the surface of water and being under no apprehension of coming desiccation stoma will be a sinecure and cuticle a burden to it. The immediate search after food not satisfied by the root system being poorly developed makes the significance of the nonthickening of the cellwalls much too important to be lost sight of, for the food whether gaseous or mineral is taken to it by the universal carrier—water. Nondevelopment of stoma on the stem makes the demand for a larger development of Intercellular spaces imperative and nondevelopment of the rootsystem and the immediate vicinage of the plant makes the demand for a fullfledged Vascular bundles almost nugatory. For intercellular spaces being more important vitally the one thing that impedes their full and lavish development must go—and that thing is the Bundle system.

Such then are the modifications that a plant is fated to undergo in order that it may fall in with its environment. Such then is the potency of his environment to call forth latent energies of organised structures to meet it half way and accord to it a fitting reception by readily noting its structural arrangements. For not alone in the particular cases we have already cited, not alone in plants having a stereotyped habitat in water where from generation to generation they have lived and thrived and multiplied but even in plants having an ordinary habitat on land and getting a chance footing in a watery bed the changes we have already referred to as being characteristic of water plants are clearly adumbrated in even the first generation, multiplying into more defined and permanent forms as they pass through a number of generations.

The stunted character of the stem of such dwarflings as we have been considering is clearly traceable in our bogplant *Marsilea* with peculiar long

petioled leaves like those of the woodsorrel (*oxalis pusilla*—Shooshny, the Bengali name). In the whole family of plants of the genus *Zostera* growing on patches on the shore between tidal levels, the stem remains inconspicuous throughout, leading to the leaves all the onerous task of remaining erect and utilising the sunshine as best as they can, while it retires obsequiously to the demand of its environment into the warm and cosy bosom of the earth. Similar, too, is the character of the plant called *Vallisneria Spiralis* found in abundance in fresh water lakes and ponds all over India and abroad and remarkable for the peculiar contrivance adopted by the spirally coiled Flower Stalk for its fertilisation. In all these instances of water plants, the leaves are inordinately long and most simple, but such characters are only concomitant with the depth of water in which the plant lives. Should the level of water sink down the upward elongation of the leaves which form the sole visible part of the plant, is proportionately reduced. Even at different depths it is found that the plants of one species have leaves of different lengths. Whatever their bed of origin, they all try to send up their leaves to a common level, a common platform. Every leaf vies with its fellows to take its place in the ring of a common zone of illumination. As if in their hurry of departure from their muddy home, to witness the performance of the melancholy drama of the world outside, they are all struggling hard to secure all the orchestra seats available in Nature's theatre. Leaving aside our native water plants for the present, if we turn to those of cold countries or where the ground is turfed periodically with a fall of snow, we get some further light thrown upon the significance of stunted stems. Quite a large number of bulbous and tuberous plants are formed in such countries springing up from the soil in summer and after having enjoyed the warm sunbeams and bracing air, retire under the ground just on the advent of winter. This adaptation for protection against too great cold, has demanded no very great sacrifice on the part of the plant. Much of the food material that it prepares in summer, it lays by

stored in the under ground thick stem, to be drawn upon in winter or the next season. Indeed in the plant technically called a Biennial, it produces only vegetative organs such as leaf, stem etc. during first summer and the food material thus prepared during this time is started for use during the next season when the reproductive organs are mainly developed. It is interesting to notice how the thickened stem, Bulb or Tuber or Corm, bury itself deeper in the earth the more exposed its habitat is to cold and frost and radiation. As a matter of fact it has of late been demonstrated that the corms of the meadow saffron (*colchicum autumnale*) may be used as marks to indicate the depth up to which a given ground and its neighbourhood are frozen for they occur imbedded just at that depth to which the winter frost is unable to penetrate. It is no wonder, then, that water plants withdraw themselves bodily into the comparatively warm retreat of the soil when the water becomes more and more cold with the approaching winter.

(*To be continued.*)

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THE ART OF FICTION.

Fiction is a prose narrative which presents a picture of real life, especially of the emotional crisis in the life history of the men and women portrayed. It may be described as one of the fine arts, in as much as it has laws and regulations as that of other fine arts, namely, music, painting, sculpture, architecture, and poetry. Unlike mechanical arts which can be acquired when the faculties that God has bestowed upon us are developed by laborious training, the art of fiction is inborn. Therefore a novelist should possess naturally several qualifications or he can never hope to attain eminence.

A novelist should be a good painter in words of the conditions, manners, customs, conversations of the people who form the subject of his narrative. To describe characters he should make an acquaintance with the world ; he must read

with a critical and observant eye the most important volume of human life and known the hearts of men and women from the depths of stratagem to the surface of affection, and in fact he should be a great metaphysician.

Many people fail in their attempt to write out a novel, for they begin to describe unreal things which might be the result of imagination. There are some who write out a novel to suit the popular taste and thereby command a large sale of their novel. There are others who write out what they had dreamt of, others again who are writing novel after novel till they attain perfection in the art. A true novelist would possess naturally several inborn character. He should have animation in relating facts, sublimity in expression, power of exciting the feelings and gracefulness in personifying characters. In writing "that which is felt must be resolved into ideas, thoughts, images and thence into words, phrases, language as a cloud or condensed vapour is transferred and distilled into rain." Before he puts his pen on a paper he should have clearness of outline, directness of purpose and above all a profound belief in the story he writes. Another character of a true novelist is the power to discriminate what is suitable and what is not suitable in certain situations. He should know what to bring forward in his novel and what he should suppress; what words he should use, what he should avoid, what figures and illustrations are in good taste, what the reverse and so on. He should not bring in too many minor personages which are not essential.

The uses of novel reading are very many. It evokes our sympathy; helps us to study human nature in its various aspects; makes us reflective and consequently to reflect upon the sorrows of mankind and try to arrive at a solution and above all it is a monument which could explain the manners and customs of people at a particular period.

(To be continued)

Madura College

Madura

V. THIAGA RAJAN.

4-3-12

TWO BOOKS ON THE ECONOMIC STUDY OF INDIA.

A REVIEW.

Economics of British India—by JADU NATH SARKAR, M.A., Professor, Patna College. Second Edition.

A Study of Indian Economics—by PRAMATHA NATH BANERJEE, M. A., Formerly Professor of Economics, City College, Calcutta. Member of the Royal Economic Society, London.

In Philosophy, Law and Literature, and even in Natural Sciences, Indian scholarship has played no mean part in the modern age. But it is singular to note that in the domain of Economics and of history—subjects, to which many of the master minds of Europe and America have given their life long devotion—we can hardly show any record. Dr. Bhandarkar is the solitary Indian representative of modern historical scholarship. The late Mr. Justice Ranade was the only Indian whom we can justly claim as an economist. But his varied activities in the realm of social reform, of religion and of politics did not allow him to devote himself exclusively to economic researches; and he, therefore, could not undertake a comprehensive study of the facts of our economic life. The necessity of such a study has now assumed an urgency which it is difficult to exaggerate. The new industrial awakening in the country is urgently calling for efficient industrial leaders trained in Economics and Finance. The solution of the problems which Indian business men have now to face does not lie so much in the acquisition of technological knowledge as in the propagation of sound economic ideas, and it is not too much to say that the future of our industrial organization will be determined by the character of men employed in its management. We must once for all realise that success in oratory and propaganda or in the professions of law and medicine does not necessarily constitute a qualification for business management. If modern civilization is to be distinguished from ancient civilization by its scientific basis, in business as in other fields of human endeavour the final appeal must be made to science. We, therefore, ought to welcome and

appreciate all honest endeavours in scientific study of the economic facts of India.

The two books under review are academic productions and are, it appears, primarily intended to be text books for B.A. Students of the Calcutta University. But at the same time the authors seem disposed to have in view also requirements of the actual business life. It is not, however, quite clear why the learned authors should have chosen to use the expressions "Indian Economics" and "Economics of British India." India certainly cannot presume to develop a science of Economics for herself alone. Science is universal, and an Indian Economics is as impossible as a British Economics, a French Economics, a German Economics or an American Economics. An Indian Economics is as impossible a thing as an Indian Physics or an Indian Chemistry. It is quite true that one can study "Economics with special reference to Indian conditions" but even that is not quite the subject of the books in question. What the authors, perhaps, really mean by the expressions, and what in fact, the subject of the books is, is a study of Indian economic data which, it must be noted, are not economics itself but raw materials as it were of the science.

The second edition of Professor Jadunath Sarkar's *Economics of British India* which is the subject of this review is an enlarged form of the first edition. Excepting some additions of some what minor importance we fail to notice in the book any improvement in regard to systematisation, analysis or explanation of fundamental facts. In some places the treatment consists of a reproduction of undigested and ill-digested, and sometimes unnecessary, statistics from original sources without a point of view. Throughout the book reveals indications of a hasty preparation. In some places it lacks academic moderation and exhibits unscientific enthusiasm. The prefatory note with the title "To my countrymen" is hardly necessary and not at all illuminating. "I know an Indian barrister who pleads in Urdu because he cannot express himself in English. Another Indian barrister puzzled the Judge of Patna by invariably speaking of the 'he-cock' when he meant Mr.

Heycock. I. C. S. A third Indian barrister (B.A. Oxon!) uses the preposition *about* after the transitive verb *concern*." To have a fling at gentlemen educated in England, as is manifest in the above passage while speaking of the boarding charges, which Indian students in England have to pay that country, as a consideration in the explanation of our balance of trade has undoubtedly detracted from the dignity and scientific tone of the work. Mr. Pramatha Nath Banerjee has however, shown commendable judgment in these matters. His book so far as it goes is throughout systematic, sensible and to the point.

As regards the knotty question of rent in India the two authors are perfectly right in holding that here rent (by which of course they mean the actual rent which a tenant has to pay his landlord) is governed by the interaction of three forces—custom, competition and legislation. "The rent legislation of India has the special characteristic, that it starts from a basis of custom and, while accepting the legitimate influence of competition, seeks to confine that influence within reasonable limits." (Imperial Gazetteer, vol. III. p.454). But when Professor Sarkar says that "in so far as unalterable custom or law regulates these payments (rents), Ricardo's theory of rent is not applicable", and when Mr. Banerjee maintains that "the Ricardian doctrine of rent is not absolutely true of any country in the world" and that "the theory can hardly be said to hold good in India," we have to note serious disagreement with the authors. The trouble here seems to be that the writers have failed to distinguish between the actual rent, which a tenant may have to pay his landlord and economic rent spoken of by Ricardo, for it must be understood that the actual rent does not necessarily coincide with the economic rent. There is rent in Ricardo's sense of the term wherever there are differences in fertility or accessibility of land, and the two authors will not certainly insist that such differences do not exist in India. It is, however, true that in this country the actual rent does not commonly coincide with the economic rent.

This is due to "economic friction" which is to be found in custom and legislation.

In the discussion on the important subject of the work of foreign capital in India Mr. Banerjee's contribution is clearer, more convincing and more informing than that of Professor Sarkar. The former writer shows the limit of the usefulness of foreign capital by referring to the views of such distinguished authorities as Sir Thomas Holland and Sir Vithaldas Thackersey. "There are some enterprises which are necessary for the welfare of the country, but for which enough capital is not available within the country, and in such cases it is desirable to have resort to foreign capital, Railways are an instance of the right use of such capital. 'But', says Sir Vithaldas, 'when we turn to the petroleum industry in Burma, the gold mines of Mysore, the coal mines of Bengal, the tea and jute industries, the carrying trade by sea, and the financing of our vast foreign trade by foreign banks, we come upon another and less favourable aspect of the question of the investment of foreign capital...In such cases I cannot but think that it would be to the permanent good of the country to allow petroleum to remain under ground and gold to rest in the bowels of the earth, until the gradual regeneration of the country which must come about under British rule, enables her own industrialists to raise them and get the profits of the industries. A country which maintains a population of thirty crores is not likely to let about one lakh of persons starve, and this is the number of wage-earners benefited by these industries. The price paid is much great for the advantages accruing from them to the country'."

With regard to the controversial question of large-scale *vs* small-scale production in India, Professor Jadunath Sarkar is clearly in favour of adopting the large-scale method. "A few pseudo-Ruskins," says Professor Sarkar, "and many old-fashioned leaders in India are trying to revive our handloom industry for the supply of ordinary clothing; but their attempt is found to have the same success as an army equipped with bows and arrows when pitted

against men around with magazine rifles and maxim guns". Mr. Pramatha Nath Banerjee's view is not so devided, although he seems inclined to agree with Professor Sarkar. "The only advice," he says, "which the economist . . . can offer to the people would be to ask them to take things as they are instead of fighting against the inevitable, to profit by the experience of other nations, and to try and minimise the evils of an industrial change." The author suggests the adoption of the principle of co-operation as "one of the chief means by which the evils of capitalism may be minimised." But even if the qualities necessary for co-operative organization be developed amongst our people, co-operation cannot be expected to solve the problems of capitalism in all its aspects, for even in Europe and America co-operation has been successful only in a very limited sphere. Mr. Banerjee is right in thinking that, 'even if the large scale system be adopted in India, small industries need not die out!' They have not died out even in Europe and America. The author's contention that "Japan is still a country mainly of small industries" is not, however, altogether valid. It is true that Japan has up to this time been a country mainly of small-scale-factory industries; but now she is on the eve of an era of industrial consolidation and concentration. As early as at the conclusion of the war with Russia, Baron Shibushawa who is considered to be the greatest financier of Japan said: "of the many important works calling for our activity there is nothing in the financial world of Nippon so important as that of enlarging the scope of our economic enterprises. In almost everything—in banking, spinning, in commercial matters generally—consolidation seems to be the order of the day.....The days of small things are over; the war has brought them to a close." (*The Modern Review* February, 1910, p. 162).

Professor Sarkar is an out-and-out gold monometalist and believes not only in a gold standard but in a gold currency for India, and he ventures to guess that about one-third of our silver currency can be replaced by gold. But Mr. Banerjee is satisfied with simply reviewing the

history of our currency legislation and stating the views of the two divergent schools of thought that exist on the currency question.

In commercial policy the two authors are opposed to each other. Professor Sarkar does not see that any case has been made out in favour of protection in India at present. "On the other hand, there are special reasons why free trade should be continued. Apart from the general considerations that protection involves an immediate sacrifice of national resources—which a poor country like India can ill afford to bear,—there is the fact that in this semi-tropical and conservative country man has a natural tendency to slacken his exertions and let matters follow their wonted course, which is opposed to industrial efficiency and progress. Such a tendency can be fought and kept down only by the freest intercourse with the rest of the world and an ever-present fear of being beaten in competition unless we ceaselessly exert ourselves and adopt the latest improvements. Protection would be a premium on inefficiency and would foster a fatal indolence. Its effect unless counteracted by the spirit of the people, is always demoralising; and we must confess with sadness that the Indian people are not like Germans and Americans." Mr. Banerjee, on the contrary, is clearly disposed towards protection. "The Indian industries which have been recently started, and those which are to be started in future, will have no chance of success if they have to withstand the competition of the well-developed and strong foreign industries. And a protective tariff in India is likely not only to assist her industries but to produce revenue urgently needed for education, sanitation and social reform." The writer should not, however, be taken to be a blind protectionist, as he tells us that "the ultimate ideal of the so-called Indian protectionists is Free Trade. They hope that a time will come when protection, having served its purpose, will no longer be needed."

On the great question of transport industries the two authors have nothing substantial to say. The history of the railway policy of our Govern-

ment, the problem of railway rates, the comparative merits of railroads and inland waterways as means of communication, the scope that exists for the improvement and extension of each of these different forms of transport facilities are questions which we should like to see discussed even in an elementary text-book.

Finally we feel bound to say that Professor Sarkar was not well-advised in introducing, with his own endorsement, the highly controversial political theory of "drain" in an economic text-book primarily intended to be used in academic study, for on critical examination the "drain" theory is found to have no economic basis. For explanation of this view we would ask the reader to refer to Leonard Alston's *Elements of Indian Taxation*. pp. 102-105.

Altogether we may say that if we are to choose one of the two books considered in this review, we would without hesitation accept Mr. Pramatha Nath Banerjee's *Study of Indian Economics*. This is, however no reflection on the scholarship of the well-known professor of Patna College whose acute methods of historical research we so much appreciate. In these days, when every branch of higher learning has assumed a vast and complex proportion, in a scientific investigation special academic training coupled with exclusive devotion alone can produce satisfactory results.

SATISHCHANDRA BASU.

THE INDUCTIVE METHOD OF TEACHING—III

(Continued from Page 317)

V. Mathematics.

According to the prevalent method of teaching mathematics a student is presented with a number of lifeless digits; and numbers, digits, signs and arithmetic, algebra and geometry have their existence only in paper or on board. They thus lack the influence which living truths can have on human minds. For things with which human

life has very little and only a remote connection fail to create any living interest in them. Occasionally the teacher, for the purpose of importing an amount of lively interest into the subject, draws a diagram or refers to some actual event with a view to solve a difficult problem ; but this much is scarcely sufficient to evoke that interest in the mind of students which can impel him to pursue the subject with keen attention or generate a genuine devotion to it.

The method that is being suggested in these pages will make the mathematical subjects vivid and inspiring by bringing them within the purview of daily avocations and the circle of human interests. Men have daily to count many things, weigh many things and measure many things. To such familiar incidents of daily life the attention of the student should be directed. From time immemorial measurements of time, lengths, and weights have been the common occurrences of material life of nations. These universal practices are intimately connected with trade, commerce, arts and industries, and with the origin and evolution of private property. It follows from this that the knowledge of these subjects will necessarily lead to the knowledge of the mathematical elements involved and mixed up with them. Man is by nature an economic animal and he has been mathematical ever since he has been economic. Economics and mathematics material life and calculations go hand in hand. And so mathematics should be learnt not as an abstract science but as having a vital connexion with man's economic practices. By being thus brought into connexion with the problems of human life mathematics can be living, attractive and interesting. The student can feel inspired in mathematics only if it be presented in the nature of problems and questions associated with the losses and gains, interests and profits, divisions and augmentations of property which men enjoy. Otherwise it is a dry, husky, unsentimental and abstruse subject which is likely to scare away many young minds.

The student will have to be introduced to the various problems that can possibly arise regarding the measurable world. Commercial dealings, profit and loss, giving and taking of debts, buying and selling, partition and exchange are subjects relating to wealth and

involve practical mathematical questions. These problems engross the greater part of human life. These and many others therefore, are the subjects to be learnt by the student. He should be asked to solve problems of measurement regarding these economic incidents of human life.

All those affairs of human life which have concern with the transaction of property, industry and commerce are extremely complex and intricate in their nature. Co-operative enterprise, joint-stock business, Banking, collection of revenue, internal and international trade are difficult transactions and demand a good deal of business intelligence and financial statesmanship for their proper administration. The student, however, will acquire a good knowledge of mathematics if he attends only to those economico-mathematical problems that are comparatively easy and simple in calculation.

In the interests of the proper development of the mathematical faculties, the learner need not grapple with 'Asses' Bridges' and 'hard knots' but should be habituated to working out such problems as do not require very great mental strain or hard and tedious calculation or involve long and troublesome processes.

The student should be encouraged to answer mathematical questions orally without the aid of signs, numbers or letters. It is not at all necessary to have recourse to cumbrous sums to understand and master mathematics. Without increasing the complexity of signs and figures and by introducing the smallest and simplest number one can learn all the principles involved in the calculations and measurements that may be possibly necessary to man in life. By these simple devices the most difficult problem can be rendered easy of treatment and solution. To work out hard exercises and solve intricate problems is not the surest indication of good knowledge in mathematics, for it is possible to give correct answers to mathematical problems simply by applying formulas without understanding a bit of the subject.

The questions therefore should be so framed and problems so presented as to involve no complex and cumbrous figures. It should be an aim to master the whole science of mathematics, and understand the various mathematical problems and operations by using small and simple figures only e.g.

number of 3 digits. Concrete objects should be placed before the learner to help his power of understanding. A very good method of teaching mathematics is by drawing diagrams and having recourse to geometrical figures. When the mathematical sense has thus been trained and the student has been habituated to solve the varying problems and calculations necessary to human life, it would be time to introduce complexities in the figures and signs and allow the several branches of mathematics their proper place in the development of his intelligence and knowledge.

VI. Natural Sciences.

We have thus seen that the inductive method of teaching would require in the case of the human sciences an intimate acquaintance with the various physical processes and operations, thoughts and ideas, diverse ideals of character and motives of action, multifarious rites and ceremonies, the numberless customs and practices, and the varied institutions and organisations that constitute the several aspects of human and social life. The object underlying this method is to impress upon the reader the vastness, variety and complexity of the intellectual, social, political, and economic spheres of man.

In the case of the physical and natural sciences also the student should be intimately acquainted with the diverse forces of nature and materials of the physical world in such a way as to realise its vastness and variety. With this object in view, the student of natural sciences would have to follow the incessant changes in the physical universe, and study minutely the different manifestations of energy and operations of nature in fire and earth, water and rocks, plants and animals, planets and seasons. The students should thus be familiar with the natural revolutions and transformations going on in this world owing to the influence of these causes, the various forms the world is assuming on account of these, and the thousand and one uses, which human beings are making of these forces, materials and transformations.

By directing his attention to these varieties of natural phenomena the students will have to acquire a knowledge of this physical world. A comprehensive observation of the

things around us must by all means be resorted to; the objects in the external world have to be perceived through all the senses. The organs of touch and sight have to be used in thus acquainting himself with the environment, each organ being adapted to its particular object. By this means he will be intimately familiar with the world. This intimate familiarity with it will enable him to understand clearly all its peculiar processes and characteristics, and will compel nature to reveal her special features and workings, manifestations and operations, and entitle him to question her about her innermost secrets and disclose the most hidden truths.

Thus the student of physics will begin by studying not the physical energies of nature in abstract, but the concrete objects and things of the world. He will take specimens of various classes of objects, *e. g.* solid, liquid or gaseous, and study the possible properties of each body. While analysing the properties of the objects the reader will be able to guess the effects of the various energies of nature on each object and get an account of the energies themselves. The natural energies and the laws of their manifestation and operation are to be deduced out of the various analyses of physical properties of the objects. They are not to be taken as the data with which to start.

So also in chemistry, instead of studying the elements in the very beginning the student will direct his attention to the chemical nature and properties of such objects as lie around him. Any knowledge of the chemical processes in plants, animals and minerals, *i. e.* an account of the various ways in which the constituents of the vegetable, mineral and animal world are being transformed, is the basis of the study of chemical science. The different chemical properties of each object are to be learnt by multifarious experiments. The student need only analyse or divide the objects and combine or synthesise them and study the varieties in effect. He has to be familiar with the thousand and one analyses and syntheses that constitute the changes in the actual, concrete world, in which we live. The chemical elements and the laws of combination will have to be deduced out of these processes and products and should therefore come at the close of chemical studies.

Just as the student of Physics and Chemistry has to study the various physical and chemical properties of the concrete objects in this world, so the student of geology has to be well grounded at the outset in a knowledge of the diverse changes of nature in land, water and atmosphere. He has to observe the lithospherical, hydrospherical and atmospherical facts and phenomena, classify them and take note of the constant shiftings of their conditions. He will thus have to familiarise himself with the incessant movements and changes of shape and size of the clouds, motions of the wind, the growth and decay of hills, the windings and shiftings of the course of streams, changes of weather and seasons &c., and use these facts for the detection of the universal principles underlying these changes.

So also the vastness and variety of the vegetable world are to be realised by observing specimens of various kinds of plants. The student of Botany will have to study at the outset not the classification of plants and of their organs, but will have to analyse each plant and study its several parts. In studying each plant, the reader has to collect an account of the external and internal characteristics, its growth and development, its habits and habitats, its food and medicines, as well as its utility to human society. Many a plant and shrub, fruit and flower will thus come under his scrutiny. These particular and individual studies of the several specimens will entitle the reader to institute comparisons and bring out points of analogy and contrast between them and ultimately to classify and generalise them and discover the fundamental principles regulating the life, growth and developments of the plants. The classification of the plants or the roots and stems should not be the data with the students of botany, but has to be found out at the close.

The remarks that we have made with regard to the study of plants are equally applicable to the study of animals. The student has to begin with the study and observation of the familiar animals. The external and internal features of these animals under investigation, their habits, place of birth, the food they eat and the use made of them by men, are the various items of information that are to be collected.

A knowledge of the external and internal

features and peculiarities of plants and lower animals combined with the same kind of information about men will give the student knowledge of the various types of living beings inhabiting the world and supply sufficient data for the formulation of laws governing and controlling the biological sphere. For this purpose the same kind of inquiry that has been suggested with regard to plants and lower animals has to be applied with regard to the physical features and frame work of the human beings. With this object in view the student will have to equip himself at the first instance with a knowledge of the various operations performed by human limbs and muscles, the movements and breathings, circulation of blood and digestion of food, etc. By thus studying the external manifestation of the life, principle and the varieties of physical actions he will be in a position to master the laws that regulate man's life and health.

(To be Continued.)

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SCIENCE AND PHILOSOPHY—III.

(Continued from Page 283.)

Chapter V.—Refutation of Dualism.

With Descartes all nature and organism are automata save mind which is an entirely different thing and to explain their relation theories like those of Occasional Cause and Pre-established Harmony are promulgated. To overcome this dualism of mind and matter, Idealists like Berkeley and Fichte reduce matter to be a product of mind ; whereas materialists like Holbach, Helvitius Hobbes and others resolve mind into a function of matter and Sceptical philosophers as Hume and Kant think that neither mind nor matter as substance is knowable and what we know are mere phenomena. But the last position is not tenable, for, phenomena are of two kinds, mental and physical, and their relation has to be explained. Parallelism says that they run side by side but does not say how or why ?

General
conception
of experience

Therefore the natural tendency is to reduce both mind and matter to one substance. Our modern materialistic thinkers say that the physical series consists of phenomena and mental series of epiphenomena or phenomena of phenomena and thereby they think they avoid the objectionable metaphysical words, cause and substance. But surely this is absurd. How could there be such a thing as phenomenon of phenomenon and how could phenomena know phenomena? Hence naturalistic thinkers feeling the absurdity really fall back upon the old naturalistic position and when they speak of physical phenomena, they mean material substance and material process and thereby they make mind a function of matter. But if mind be a phenomenon, it cannot know matter which is also phenomenon—that which knows must be something real. If the world known is reduced to phenomena how can we distinguish between the phenomena which we know and the phenomena which are known? Again what we call the world is really construction of our own minds—ideas of matter, motion &c. all belong to the mental epiphenomenal series. How then are we distinguish the two series? Evidently the whole system of thought is full of confusion and contradiction, to avoid which we must avoid dualism, we must forbear severing mind from matter.

The foundation of our knowledge is not a plurality of things nor a series of phenomena but a single mental whole. All knowledge begins from a mental whole from a unity of of subject and object and the ego in thinking resolves itself into subject and object, distinguishes itself from and objectifies its own contents which it views as external world under forms of space, time etc. This is mainly the theory of Kant, but in Kant there is an element of dualism. He thinks that the contents of mind viz. Sensations are supplied by things in themselves. Fichte does away with this dualism and reduces all things to the self-evolution of one ultimate ego. His successors, Schelling, Schopenhauer, Hegel and Lotze only modify and correct his theory and make the world to be the self-evolution of one mental power (Idealistic Monism). Hence, the only tenable dualism is a dualism of poles, of subject and object which are not two fundamental substances

but only two aspects of the same thing *i.e.* phenomenal dualism. Now are we to conceive this fundamental unity and phenomenal duality of experience as the only reality (Subjective Idealism) or shall we suppose that they spring out of one transcendent objective reality? If so, can we form any legitimate conception of that reality? Thus we come again to the fundamental question of epistemology and metaphysics—how do we know and what do we know? Are we bound to limit ourselves to our conscious experience (Hume, Mill, Spencer) or can we transcend it and form a legitimate conception of the fundamental reality?

Descartes and Locke think that beyond the inner circle of mental sensations and ideas lies the outer circle of matter which is an altogether different substance, but it is difficult to explain the passage of mind to matter which it knows. With Berkeley no such world of matter exists. The only substance that exists is mind and its ideas. Hume goes further and denies the substantiality of mind also and holds that sensations and ideas are all that we know. Kant resolves the reality of self as an active principle which builds up experience by giving form and order to the materials of experience supplied from without by thing-in-itself. But the old difficulty still remains unsolved. What is the nature of the thing-in-itself and how does it come to affect the self from which it is, perhaps, different. The difficulty left by Kant regarding the affection of the self by the thing-in-itself is solved by Fichte who thinks that the world which the finite ego experiences is but the limitation imposed upon itself by the absolute infinite ego—the world is the creation of the ego in limiting itself. But in this case matter will still remain foreign to the conscious ego. Ward, however, objects that the finite ego ought not to be conscious of the limitations not created by itself, but here Ward's objection is not satisfactory. Now rejecting the theory of thing-in-itself held by Kant and that of the "ego" of Fichte, we have to fall back on Natural Realism of Hamilton and Reid—that in sensations we are cognisant of a material world present immediately to us. What are we to conclude as to the origin of sensation? Is it subjective or objective? Ward holds that though it may be, in one sense, called subjective being states of the

Naturalistic
tendency

Historical
review

Epistemological
monism.

individual mind, yet one feels that it is imposed from without by things existing independently of himself (Is not this a sort of dualism and does not Ward himself contradict here as it is inconsistent with his monism of consciousness?) and that under the same circumstances all men experience the same sensation and therefore, according to Ward, it is only proper to conclude the objectivity of sensations. Ward, however, is not at all clear: Sensations are not modifications of mind for, then they are subjective, nor are they modifications of matter for then they cannot be known at all; hence they must be what the Realists suppose but realism involves dualism which Ward had rejected!

But though Ward rejects the dualism of substances and of series (parallelism) and though he declares for monism yet he admits within the sphere of mind a logical duality of the thinker and the thought, of subject and object. But how are we to understand this duality? Are we to suppose that the feelings and ideas make the subject, that the subject is but the aggregate of or the focus to which concentrate the feelings and ideas—this would be sensationism of Hume, Mill &c.? Or we may hold that the ego by evolving and objectifying its ideas makes what we call world so that the object is but a mode of the subject—this is Idealistic Monism of Kant, Fichte, Berkeley, Grün, Caird, Stirling &c. A third solution is by supposing the subject and object to be parallel series produced by an unknown power. This is, however, the rejected parallelism of Spinoza and leads to the difficulty of explaining that unknown something which lies beyond but which we are still obliged to think. Ward thinks that all attempts hitherto made to explain experience from anything below or beyond it have proved futile and we ought to rest satisfied with assuming that experience is a continuity consisting in the correlation of subject and object, and thus we see that after all his criticism Ward falls into the most extreme form of agnosticism.

Ward while criticising Kant says that space and time as well as sensations are not subjective productions of the ego but correspond to an independent external reality and are known by experience e. g. space by movement. This is also the sensationist account of our

idea of space and time. Agnostic as Ward's position is, his space and time cannot have objective reality independent of experience but must be abstracted from the contents of experience. Therefore Ward's own account is not essentially different from the empiricist and the sensationist ones. Kant says that we think of space as a totum which we divide into parts in our imagination and this idea cannot be derived from experience for addition of parts would not give us the idea of infinite space which must therefore be a priori. Ward on the contrary thinks that by the gradual extension of our sphere of experience we get the idea of larger and larger space until by abstraction we reach the idea of space as a totum. Kantian reply is that movement, being necessarily in space, presupposes the existence of the idea of space in order that the experience of movement may be possible. Ward's position, however, is not very clear. He wavers between two schools—the experimental and the idealistic—using each to refute the other. His conclusion is that mind is a unity necessarily breaking up into subject and object—a duality which must be accepted as ultimate and inexplicable. But this conclusion is unsatisfactory for it does not explain how the two correlative factors necessarily rise out of one ultimate reality—rather, Ward seems to say that of the two factors each is independent of and outside the other. The key to Ward's inconsistent position will be found if we note that on the one hand he accepts the conclusion of experiential psychologists while on the other hand he tries to refute the popular realism in all its forms. Ward declares for spiritualistic monism and refutes dualism but it is not clear what dualism he means, metaphysical, epistemological or realistic. Our experience breaks up into two series, the knower and the known, subject and object opposed but corresponding to each other. Ward refutes this parallelism though his view accords rather with this dualism than with monism; for, the true epistemological monism is that of Kant and especially of Fichte who hold that the world is the self-evolution of one ultimate mental principle, but yet Ward opposes this view, for, according to him, sensations and percepts are not evolved by but imposed upon the mind. Ward's position seems to be the same as that of Berkeley: percepts

Ward's
position
examined

Ward on
Kant

and ideas are imposed upon us not by non-mental things existing externally in space (realism) but by an omnipresent mental power *vis.* God. We still have to build up our knowledge out of experience but this experience is not due to an external world in the sense of its being extramental. Thus Ward rejects the distinction between external and internal—subject and object both are within the mind of which they are two poles as it were.

Mind began as a homogeneous mass of consciousness, but this by necessity of thought resolves itself into two terms—subject and object and henceforth the object presents itself as something independent and external. Mind splits up into subject and object and this object again, because forced on the subject, is thought of as external to and independent of itself. Again to other subjects the same objects are present as to us and hence the idea that the objective world exists independently of all minds as an extramental reality and sensations and percepts though really affections of the subject being the same for all subject are regarded as the inherent qualities of the objects. This is Naïve Realism or as Ward calls it Trans-subjective Realism. In Ward's opinion the mere fact of the same objective world being present to all subjects is not sufficient to warrant our view of the world as an extramental reality.

Naïve Realism regards the world as existing independently of all minds, hence we must either treat mind as a casual product of the material world which is materialism or suppose that the mind and the world are two different substances which is dualism. The difficulties of materialism have already been shown and it now remains to examine dualism. We have seen that dualistic belief is confirmed by two facts the "Inter-subjective Intercourse" and the animistic tendency to attribute mind to natural things. In this phase of thought four terms are involved—two subjects and two objects; there is the individual subject with its concrete individual object of experience; and there is the collective subject, humanity, with its collective conceptual object, the world in general, which in its essence the same for all men. Kant always maintains this distinction between the

concrete objective element in individual experience and the conceptual universal element in the knowledge of the race. Here we have a form of epistemological dualism—world as known by individual and world as appears to the race. There is another form of epistemological dualism in the distinction made between experience and reason, between the apriori and aposteriori elements in our knowledge. In Descartes' System there are two kinds of dualism the metaphysical dualism of substances, mind and matter, and the epistemological dualism of experience and reason in the form of innate ideas, and in asserting the dualism of mind and matter, Descartes reduced the latter to mechanism and left an impassable gulf between the two. These ideas of Descartes have been taken and modified by modern naturalistic thinkers. Of Descartes' experience and reason they have rejected the latter and have retained the former and in accepting his mechanical theory of matter, they have rejected his theory of mind as an independent substance and reduced it to a phenomenon of matter or more properly to an epiphenomenon—matter itself being phenomenal. But we have seen that this method of overcoming dualism is futile and self destructive. Kant tries to overcome dualism by explaining knowledge as a single unitary organic system and insists upon the synthetic unity of apperception but notwithstanding all his attempts he falls into dualism—dualism of theoretical and practical reason which he fails anyhow to connect together and dualism of sense and understanding, a dualism in the sphere of intellection. Kant tries to overcome this dualism by means of his schemata, but the old difficulty of bringing together in one whole Sensations which are imposed from without and categories which are supplied from within still remains unsolved. In his second edition he tries to overcome his dualism by making self to be an essentially active principle and thereby subordinating intellect to will; but he does not transform his original system in the light of his latter theory so that the original dualism pointed out in his system still survives. But sensations are not strictly speaking what Ward says *vis.* something put into the mind from without. Outward influences being acted upon by the self become sensations so that they belong as much to the sphere of mind as the categories. In fact, sense and

experience are stages in, and together make up one complex whole of experience. External influences are converted into sensations by the activity of the ego and these sensations are then interpreted in terms of the categories. The deficiency of Kant lies in his failure to work out fully the idea of the ego as an active principle, always energizing. This has been done by "Modern Psychology". Thus Kant could not explain the origin of categories, but modern psychology has shown that the idea of causality is derived from the consciousness of ourselves as an active principle, producing effect upon other things, and that the idea of substance must be derived from within ourselves. External things manifest themselves to us through sensations and before we attribute substantiality to them we must already have the idea of substance which we derive from our own consciousness—we must be conscious of ourselves as substances. We do not however think of ourselves as material substances or as a logical residuum after the abstraction of all qualities (Locke), but we are substances in the sense of being permanent centres of energy which give continuity and consistency of form to our active energies.

Review of
Agnostic
Monism

The ordinary primitive way of thinking is dualistic—a mode of thought which is confirmed by inter-subjective experience; but on reflection the untenableness of dualism becomes apparent and the tendency is towards Monism *i. e.* the derivation of both subject and object from a common source and this has been attempted by Materialism, Idealism or Spiritualism and Neutral or Agnostic Monism which treats mind and matter as derived from one substance the nature of which, however, is unknown and unknowable. Dogmatic materialism has been discarded by scientists and merits no consideration. Agnostic monism is still popular because naturalistic—mind is sought to be explained from strictly mechanical considerations while the difficulties of materialism are avoided by treating matter itself as phenomenal. This monism essentially the old materialism for matter and mind though referred to an unknown source, being made subject to the same mechanical laws, are stripped of their characteristic distinction; and there is a perpetual tendency of neutral monism to fall into materialism for though neutral and

material series are spoken of as having a common unknown source, yet attempts are always made to derive mind from matter which therefore seems to be the ultimate substance—(c.f. Spencer). Thus we see that agnosticism is not a sufficiently tenable hypothesis.

Now before proceeding to see whether it is possible to deduce matter from mind in a consistent manner let us examine

Agnostic
admissions
point
forward to
spiritualism

closely the admissions made by agnostics themselves. Huxley says that we are directly conscious of mind only in terms of which we know matter. Matter without mind is inconceivable but mind without matter is not so. These confessions are no doubt inconsistent with his own doctrine but nevertheless show that sometimes he himself felt the weakness of purely naturalistic position. Another confession of Huxley is that our notion of necessity is a logical or mental one and cannot be derived from the physical world. Hume has shown that in the physical world we only find succession of events in time which uniformly and invariably take place in a certain order. But mere uniformity of sequence does not give us the idea of necessity and this must be supplied from within and then read into nature. Hume says that in experience events which invariably follow one another become so associated that, we, thinking of one, cannot help thinking of the other and this association leads to expectation which being repeatedly confirmed by experience gives rise to an instinctive belief in uniform and necessary laws. In this matter Hume anticipates Spencer according to whom necessary beliefs are both innate and experiential. Mill's view is different, he explains such beliefs as inductive generalisations. Hume conceives mind to be a passive product and hence cannot explain how the idea of necessity which is undoubtedly a logical one can be read into nature. With Kant on the other hand, mind is an essentially active principle building up its own world of thought but transforming what it receives from nature according to the laws of its own. But if the finite mind be an active power building up its world of experience, may we not, then go a step forward and conceive that the whole world is evolved by a mental power according to mental laws? Hence Kant's

thought leads to Spiritualistic Monism according to which the world is the product of an absolute mental power and our world is the reproduction of that from our finite points of view. In this theory the difficulties of materialism, dualism and agnosticism do not exist. But if we conceive nature as evolved by a mental power, we must be able to explain natural laws as teleological *i.e.* adapted as means to ends.

We aim at knowledge merely because it shows us with the means of our self-preservation, similarly we regard the world as a systematic unity because such conception is necessary to enable us to control nature. The uniformity of nature, therefore, is a postulate of our own making. But where do we get such conception from? From analogy of our own minds. In self consciousness we are conscious of our self as a system of powers and faculties working according to laws of our own nature, and this idea we extend by analogy to nature. Kant also says the same thing—self is a creative principle reducing to order and harmony the materials of knowledge. With Hume, however, mind is only a passive aggregate of sensations, feelings and ideas, having no necessary connection among them, and this being his view of mind, he cannot think of nature as a unity or system of laws. Kant, on the other hand, teaches the essentially active nature of the self as an organising and unifying power which builds up its own world of thought by interpreting the influences given from without. This unity of the apperceptive self is read into the world which is therefore regarded as a system of connected things and laws controlled by a synthetic organising absolute power. Again acting, as we do, teleologically *i.e.* by means towards ends, we come to regard the world itself as a system of means and ends controlled by a supreme teleological principle.

(To be continued.)

C. C. SINHA.

On a complete Investigation of a Phenomenon taking place beyond the Critical Angle

(Continued from Page 351)

IV.

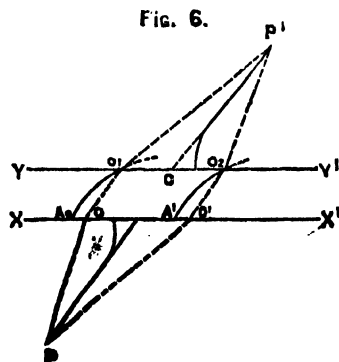
On the Transmission of Light beyond the Critical Angle through a Thin Film of a Rarer Medium.

We are now prepared to account for the passage of light into a third medium for which the velocity of propagation is the same as that for the first, when the incidence exceeds the critical angle.

The possibility of the existence of a path of the refracted ray in the second or rarer medium for an incidence exceeding the critical angle has been established from theoretical considerations, the path marking the limit up to which disturbances proceeding from a point on the surface are propagated. The limit to which the path extends from the bounding surface has been calculated to be $\frac{d}{2} \sqrt{(\mu^2 \sin^2 i - 1)}$ which is the length of the semi minor axis of the elliptic path of the refracted ray.

If there exists, then, within this limiting distance, another surface separating a third medium for which the velocity of propagation is the same as that for the first, there is reason to expect that the disturbances caused in the second medium becoming incident to that surface will be transmitted into that medium.

Let YY' (Fig. 6) be the surface of separation of the third from the second or less refracting



medium parallel to XX' . Let O_1 and O_2 be points on this surface at which meet two consecu-

tive elliptic paths A_0O_1 and A_1O_2 due to disturbances proceeding from O and O' points on XX' as two consecutive centres of disturbance and having their origin to disturbances proceeding from P , a point on the incident ray. Let P_1 be a point in the third medium such that disturbances proceeding from P reach P_1 simultaneously along the two consecutive paths POO_1P_1 and $PO'O_2P_1$. Since it is evident that O_1O_2 is equal to OO_1 and OO_1 is equal to $O'O_2$, these two paths must be equal, hence,

$$PO + OO_1 + O_1P_1 = PO' + O'O_2 + O_2P_1$$

therefore $O_1P_1 - O_2P_1 = PO' - PO$

which is equal to k or $d \sin i$(18)

Hence the locus of P' is a hyperbola of which the eccentricity, the transverse and the conjugate axes are equal to those of the hyperbola representing the locus of P the path of the incident ray. The direction of its asymptote makes an angle equal to i or the angle of incidence with the normal to the surface and meets it at a point C .

Limiting Thickness of the Film.

It appears from theoretical considerations that the thickness of the film through which such transmission occurs must not exceed the limit given by $\frac{d}{2} \sqrt{(\mu^2 \sin^2 i - 1)}$ where d is the distance between the two consecutive centres of disturbance O and O' on the surface of separation XX' . Since in the case of ordinary reflection and refraction we get only one reflected and one refracted ray, the quantity d or the distance between the two centres of disturbance cannot exceed the wave-length of the incident, as well as, the refracted light. Hence the limiting thickness must not exceed $\frac{\lambda}{2} \sqrt{(\mu^2 \sin^2 i - 1)}$. I examined a film, formed by cementing together two pieces of microscopic cover-glasses with air enclosed between, by reflection at almost perpendicular incidence, using mono-chromatic light, and found that the space through which transmission occurred, when the film

was suspended vertically in a cylindrical vessel containing water and the whole rotated until the incidence exceeded the critical angle, was bordered with a dark fringe which was the second in reference to the first or the central dark spot corresponding to where the glasses were in actual contact. Since this corresponds to a thickness $\frac{\mu\lambda}{2}$, the thickness of the film at the border of the space must not exceed $\frac{\mu\lambda}{2}$ which fairly agrees with the result obtained above.

Newton measured the thickness of the film, formed between the hypotenuse surfaces of two glass prisms and found that in some cases it was not above the ten hundred thousandth part of an inch, that is to say, nearly one-twentieth of the length of a wave.¹

Fresnel, by measuring the breadth of the space through which transmission occurred and comparing it to the diameters of the coloured rings, found that the interval of the glasses at the border of the space exceeded the length of a wave.²

M. Quincke repeating the experiment with a prism of flint glass, measured the thickness of the film at the border of the black spot and found the same to be an inferior limit of the distance to which the vibratory movement is propagated. The thickness in certain cases was 2μ , 50, that is, nearly 5 wave-lengths.³

"Besides, there does not seem to exist a very remote relation between this phenomenon and the evanescent vibration of M. Cauchy, for the theory seems to indicate that the depth to which the movement of the evanescent vibrations are propagated should only be a fraction of a wave-length"⁴

1 Newton's Optics Book II, Query 29.

2 See Extract p. 12.

3 Mascart's Traite d'Optique tom II p. 499.

4 Ibid.

CONCLUDING REMARKS.

There are some particular points in connection with the above investigations which require some explanation. In the first place, it has been pointed out to me that in my attempt to prove that the path of a ray becomes curved both before and after incidence to a surface, I have assumed the rectilinear propagation of light, and hence the conclusions arrived at could not be accepted. In reply to this let me refer to Fig. 1 page 284. The disturbances proceeding from P on meeting the surface XX' cause in that surface new centres of disturbances from which wave-lets begin to be propagated in both the media; the effect at P' and P'' being due to the resultant of these wavelets. Since the wave-lets starting from O and O' reach P' and P'' severally in the same phase, the effects at P , and P'' are due mostly to disturbances proceeding from O and O' as two consecutive centres of disturbance, whereas, those proceeding from other portions of the surface or the remaining centres of disturbance neutralise one another at P' and P'' by interference and so their effect at these points is almost nil. It must be borne in mind that the distance between O and O' is a constant length and a measurable quantity depending on the wave-lengths of the incident, as well as, the refracted light; for, it is easy to perceive that it cannot exceed them since we get only one reflected ray corresponding to a given incident ray. Thus we find that the effects at P' and P'' are due to wave-lets proceeding from O and O' as two consecutive centres of disturbance, the disturbances of the latter having their origin in those at P . Now, we may regard the disturbances from P reaching O and O' either direct from P along the paths PO and PO' respectively or by being handed down from point to point as consecutive centres of disturbance beginning from P , and in that case the locus of the point or the path of the ray must be a hyperbola.

In considering the effect at P' and P'' due to disturbances proceeding from O and O' , it is easy to see that the wave-lets starting from O and O' meet in the same phase at points the loci of which must likewise be hyperbolas passing through P' and P'' along which new sets of waves begin to be propagated. The phenomena of interference and diffraction also point to the same conclusion; for the so called interference or diffraction bands are nothing but the sections of so many rays of light of which the paths are evidently hyperbolic¹ having their origin in two similar sources situated very near to each other.

We come to the next question of importance. In considering the path of the refracted ray we started with the hypothesis that the difference of the paths OP'' and $O'P''$ (Fig. 1) was constant. But in discussing the case when $\frac{k'}{d}$ or $\mu \sin i$ was greater than unity, that is when the incidence exceeded the critical angle, we found that the sum of the paths instead of their difference was constant, in consequence of which the locus of the point was an ellipse. So long as $\mu \sin i$ was less than unity or the incidence short of the critical angle, we had no difficulty, but as the incidence exceeds the critical angle the difficulty arises for then we find that the sum of the paths instead of their difference becomes constant. Here the question arises whether we are justified in accepting that as forming a part of the hypothesis and the conclusions based thereon as valid and sound. To this it may be replied that the phenomenon of total reflection is not an isolated one but forms only a part of a continuous whole, namely, the phenomenon of refraction. Hence the one and the same theory should explain that, as well as, ordinary refraction. The conclusions based on both the hypotheses considered as a whole, are of a general and comprehensive character and

form a continuous whole; the hypotheses, too should be of a similar character and the transition from one to the other is quite natural and a necessary consequence of their generality also. Again, the very fact of stating the condition that $\mu \sin i$ is greater than unity requires that the sum instead of the difference must be constant. Hence, although the fact of the sum of the paths being constant did not come up at the outset, we were justified in recognising the same as forming a part of our hypothesis as it appeared in the course of investigations.

Let us next consider how far we were justified in assigning the term "path" to the loci of the points P , P' and P'' and what interpretation should be given to it in each particular case. In the case of the incident ray we may regard the disturbances from P reaching O and O' by being handed down from point to point and we may be justified in applying the term to the positions of the points in succession of which the locus is a hyperbola. In the case of the reflected ray we may be justified in applying the term to the locus of P' at which wave-lets issuing from O and O' meet in the same phase, the locus being likewise a hyperbola. The same reasoning applies with regard to the refracted ray so long as that is limited by the condition that the incidence does not exceed the critical angle, the path being likewise the locus of P'' which is also a hyperbola. Thus far we experience no difficulty; but as $\mu \sin i$ becomes greater than one or the incidence exceeds the critical angle, the difficulty arises. For, here, the sum of the paths OF'' and $O'I''$ instead of their difference becomes constant; in consequence of which the locus of P'' is an ellipse with O and O' as foci. From this it follows that the wave-lets starting from O diverge into the second or the rarer medium and after traversing a space bounded by the ellipse, the locus of P'' , behave as if they suffered reflection on encountering a surface coincident with the ellipse. Then becoming convergent they ultimately reach the point O' in the same phase in which the disturbance from P' reaches O' along the path PO' . Here, the locus of P'' limits the space, the ether of which takes part in the propagation of the disturbances constituting, otherwise, the refracted ray, that are transmitted back into the first medium reinforcing those constituting the reflected ray and causing, thereby, the

phenomenon of total reflection. The space itself being filled with disturbance of the kind termed by Stokes, normal superficial undulations.¹

Thus we find that there exist two kinds of propagation, one for which the difference of paths with reference to two infinitely near points on the surface as two consecutive centres of disturbance is constant and the other for which their sum is constant. The former is progressive and known to us as ordinary light and is to be met with in every optical phenomenon. But the latter is superficial and partakes of the nature of vortices. Its occurrence is almost rare as taking place only in connection with the phenomenon of total reflection forming, as it were, a connecting link between that and the rest of the phenomena of refraction. It is, however, capable of being again transformed into the other kind or ordinary light on being refracted into a more highly refracting medium as explained in the above investigations.

The failure of the method of obtaining a wave-front for the third medium by the application of Huygens's construction based on the wave theory of light, is evidently due to the fact that it recognises only the propagation of the former kind so long as that takes place along a straight path and does not therefore become applicable when the contrary is the case. Neither does it become applicable to the propagation of the latter kind since that constitute motion within a closed surface.

Besides, it is natural to expect that the deviation of the path of a ray in its transition from one medium to another should be a gradual process, instead of being abrupt, as the above investigations testify.

J. RAY.

¹ Stokes' "On the Formation of the Central Spot of Newton's Rings beyond the Critical Angle." Mathematical and Physical Papers Vol. II page 64.

ARTICLES and CONTRIBUTIONS
SPECIALLY USEFUL TO STUDENTS.

THE FIFTEENTH CENTURY LITERATURE.

1400—1500 A. D.

It is an established proposition in the science of the literary history of any country that great periods of literature are almost invariably followed by comparatively dull seasons. "The phenomenon has been compared, almost *ad nauseam*, either to the alternation of the crest and hollow of a wave or to the oscillations of a pendulum. It has not been so frequently, if ever, remarked that the oscillations are increasing in rapidity. Rather more than two centuries separate Chaucer* and Shakespeare†, about a century and a quarter separate Shakespeare and Pope‡, while not more than a century intervenes between Pope and Wordsworth§. In poetry, the fifteenth century is the trough of the wave, the backward swing of the pendulum."¶

The up-and-down activity of the fourteenth century, which gave us litterateurs like Chaucer, Langland and Gower, was followed by a comparatively lethargic movement of Lydgate and Hoccleve. After Chaucer's death, the entire literature of England, as well as that of Scotland—whether cultivated poetry of distinguished writers, or crude productions of humble votaries in the Muses' shrine—betrayed an unmistakable influence of Chaucer, either direct or indirect.

The passiveness, which this century was subject to, has been ascribed to causes, political and social—foreign and civil wars, industrial revolution etc. But Mr. John Mathews Manly contributing to the recent edition of *Encyclopædia Britannica* is of opinion, that while it is true, that the commotion of the Wars of the Roses, as well as the tremendous industrial growth of England, during the fifteenth century, distracted the minds of men from literature, yet at the same

time it cannot be gainsaid that there was really a dearth, at this time, of intrinsic literary ability. If there was a man of a truly literary bent of intellect, he would have turned to literature and art, and thus have poked the fire lighted by Chaucer, to prevent it from burning out, and even have made it brighter still, though commerce and science were the dominant attraction of social life. Did not Milton build up his literary genius in the midst of a tremendous revolution, and even working upon the materials, supplied by the situation; I admit, though, that Milton had not fallen in such bad times as the followers of Chaucer had.

The reason why the followers of Chaucer failed to keep to the path pointed out by their great master, was their lack of taste and analytic power. They had not the eye to discern that Chaucer's mature works were far superior to his early writings, in point of technique and they imitated the latter exclusively. Moreover, the great vogue of allegorical writings in England and France developed in them a predilection for such composition. In addition to these, a fantastic idea had taken possession of their minds, namely, that a good literature must needs be as wide apart from ordinary direct speech as possible. This gave rise to an artificial diction and an intentionally perverted order of words. Another difficulty, which the writers of this century, laboured under, was that they could not scan Chaucer's verses, with proper accents and pauses; and so they failed to copy the smoothness of Chaucer's decasyllabic lines.

The poetry that was written for the popular minds, was the most original and powerful. They betrayed no deliberate effort at embellishment. Of these, three classes may be distinguished—songs and carols, ballads, and dramas. Songs and carols,—“the masterpieces of tantalising simplicity”—existed before the Norman Conquest, but the peculiarity of the present productions was that they were more or less modified by the French influence. Almost all of them are subjective, and they treat of religious, secular and religious-secular subjects. The ballads, narrative or epic, dealing respectively with recent events and traditional topics, were very like the songs and carols. There was a perceptible effort at artistic manipulation in this class of com-

* 1340—1400

† 1564—1616

‡ 1688—1744

§ 1770—1850

¶ A. J. Wyatt.

position. The dramas were in reality *epic ballads*, dramatized. The *Christmas Plays* (usually of St. George) and the *sword-dance plays*, the reminiscences of which are found in Ben Jonson's masques and plays, belong to the period. The Cycles of scripture plays, — the *Mysteries*, as they are called and chiefly the *Townby* (or *Wakefield*) cycle, owe their origin to this period. They survive for us in the pageants of Cain, of Noah and of Shepherds. Moreover, the *Abraham and Isaac* plays of the Brome Mss., of which *Castle of Perseverance*, *Pride of Life* and *Mind* bear the impress, belong to Post-Chaucerian Age, or rather to the latter part of the fourteenth Century. The last class I mean the *miracle* plays—did not die out, as it is believed it did, as it was born, but, in reality, they went down to the posterity.

The chief of the poets who closely imitated Chaucer, though failing to appreciate the spirit of the great poet, were Lydgate and Hoccleve. "My father Chaucer would willingly have taught me," said Hoccleve, "but I was dull and learned little or nothing."* These two names—Lydgate and Hoccleve—are inseparable from each other, in the history of literature, because of both their idolatrous admiration of Chaucer, and their supposed relation to their great predecessor. To these poets, 'style' is identical in meaning with decoration and embellishment, classical allusion and personification, 'ornate diction' and such other superfluous, gorgeous appendages. Lydgate is often ranked with Chaucer while Hoccleve lags behind; and though Hoccleve is less prolific and vigorous than Lydgate, he has the merit of being more humorous and original than Lydgate. He is not so slavish an imitator of Chaucer as Lydgate is, though on that account, not the less solicitous about conveying his master's name to the posterity.

John Lydgate (1370?-1446?), born at Lydgata, was the monk of Bury St. Edmunds in which monastery he lived a long time and where he breathed his last. He was a voluminous writer, and much that are the properties of others are ascribed to him. His translations, (estimating about 140,000 lines) are mostly epic and his original writings are, almost in all cases, allegorical love-poems and didactics. His epics record nothing

more than the miscellaneous narratives of the time both true and fictitious. In spite of the existence of some occasional good passages, these are merely dull lifeless compositions. His allegories are skilful rearrangements of old figures and machinery. Lydgate's works, on the whole, do not speak of any sentiment peculiar to the author and him alone; they are more or less products of ingenious recasting and skilful handling of second-hand facts and ideas. "The fault is not that the old is repeated, that a twice-told tale is re-told, but that is re-told without being re-imagined by the teller of the tale, without taking on from his personality something that was not in it before."* This is a besetting fault, which Lydgate had in common with all post-Chaucerian writers. Several among the large number of his works, may be mentioned;—*The Complaint of the Black Knight*, *Temple of Glass* (on the lines of *House of Fame*), *Troy Book*, *Story of Thebes*.

Thomas Hoccleve (1369?-1450?), born at Hoccliffe, was a clerk of the Privy Seal. He inherited Chaucerian manners to a great degree. Hoccleve's brain was stuffed with Chaucer's phrases and words, and he tried to follow as closely as possible the English bard of the fourteenth century. He tried to impart to his verses the melodious movement of the so-called 'riding rhyme.' Unlike the dreary imitators, of fifteenth century, Hoccleve did not adopt the allegorical works of Chaucer as his model. His more important works are *The Governail of Princes*, and *La Male Regle de T. Hoccleve*,

"One point that should be noticed with regard to these *soi-distant* followers of Chaucer is that their attitude differs entirely from his as regards their own times. Lydgate and Hoccleve mark no progress in English verse: they are reactionaries. By nature they were both incapable of writing English as though it were their own language. Both monk and lawyer would have found themselves more at home in Latin or Norman French. Lydgate's work eventually resolved itself into translation. Hoccleve began his career by adapting, without acknowledgement, in his *Epistle to Cupid* (1402), Christine de Pisan's *L'Epitre au Dieu d'Amours*. Both, again, abandon the wordly wise tone

about love and chivalry which Jehan de Meung adopted in his part of the *Roman de la Rose*, and go back, in their allegories, to the stereotyped notions of the feudal period, which, in Chaucer's work, are conspicuous by their absence. And while Chaucer had satirised the abuses of the church and magnified the virtues of the Wycliffites, Lydgate and Hoccleve show all that fervent orthodoxy which returned with the accession of the House of Lancaster. A great deal of this reactionary spirit may be put down to the circumstances of these poets; but the whole tone of their work is a natural ultra-conservatism. Their admiration of Chaucer was doubtless unfeigned; their failure to imitate his methods arose from their incapacity to comprehend his spirit. Their position sufficiently explains the deadness of English literature in the fifteenth century."*

I shall speak of one more poetry-writer of the fifteenth century, before passing on to the survey of the Prose literature of the same period. King James I (1394-1437) of Scotland has been called the greatest poet of this century. This royal poet is the subject of many melancholy romances in history. His *The Kings Quair* was written in Chaucer's metre,—since called, from this poem, *rime royal*—and under romantic circumstances and surroundings. He was in captivity for the length of the time between 1406 to 1426, first in the Tower, and afterwards at Windsor. Thompson describes the circumstances thus—

"One day in 1423, he saw, walking in the garden below his window, Joan Beaufort, daughter of the Earl of Somerset and, falling then and there in love, composed his poem in her honour."

The work clearly testifies to the influence of Petrarch, "the chief intellectual guide of Europe" at that time. It is gratifying to learn that the same lady afterwards became the Queen of Scotland, with James I on the throne. He has also left behind some ballads composed in his national tongue—the *Lowland Scotch*. These "dealing with the common life of the people, show a remarkable humour, untrammelled and exuberant."† In 1437, the King was assassinated at Perth by his noblemen.

Courthope, in his excellent *History of English Poetry* says,—

"From Chaucer downwards, we may distinctly observe in English poetry the confluence of three great streams of thought, which blend in a single channel without any of them ever quite losing its separate life and identity. Of these the first, and perhaps the most powerful, is the genius of Race, the stream of Anglo-Saxon language, character, and custom, modified by the influence of Scandinavian imagination, as well as by all the impulses and ideas derived from the Latin nations through the Norman conquest. The second is the tradition of Education systematised by the Latin Church, many traces of which still survive in the courses of our universities and public schools. The third is the tradition of Graeco-Roman Culture, carried through the barbarous ages in many slender ducts and channels, which, mingling the spirit of the ancient world with the infant civilisation of Europe, prepared the way for the great revival of arts and letters commonly known as the Renaissance."

If fifteenth century was bad in verse, it was worse in prose. The technique of prose composition had not been studied with even so much care, as that of verse-composition had been. Indeed, a large amount of prose was written in this period, but very little of them was worth anything. There was practically no difference between prose and verse, except the fact of the absence of rhyme in the first.

Of the few prose writers, worth the name, Sir Thomas Malory certainly occupies the highest place. He is essentially the author of *Morte Darthur*, or, the Death of Arthur. It has been said and with justice, that "Malory did for English prose what Chaucer had done for English poetry."* His *Morte Darthur*, printed by Caxton in 1485, is a compendium of the numerous legends which sprung in the Medieval Ages, about the romantic Prince Arthur. "It is not, however, as the first of a new species, but as the final flower of an old that this glorious and shining book retains its place in English literature."†

Reginald Pecock (1395?—1460?), successively Bishop of St. Asaph and of Chiches-

* Thompson.

† Thompson.

* A. J. Wyatt

† John Mathews Manly

ter, was an assailant of the Lollard heresies. Hence his most famous work, *Repressor of Overmuch Blaming the Clergy* (1449), failed in its object. Pecock's writings are an excellent example of controversial prose. Before him, there was hardly any writing, which might be strictly called by that name. His mind was transparently logical, so that, all he wrote, are marked by clear reasoning.

Sir John Fortesque (1394?—1476?), best known as the author of *Governance of England or Difference between an Absolute and Limited Monarchy* was every inch a peer of Pecock. He was a keen controversialist and philosophical writer.

One should not omit, however, to mention in this connexion, John Capgrave (1393—1464), the author of *Chronicle of England*, who, living, as he did, remote from busy haunts of culture, was uninfluenced by the dominant ideas of the time; and William Caxton (1422?—1491?), the translator, the publisher and the printer, who though not giving birth to a new era, was, at least, instrumental in directing the public taste to the best productions of his time, and that before him, by his epoch-making invention.

The dramatic achievement of this century has been touched upon before. It will suffice to notice, here, that the first step towards secularisation of the drama was taken in the beginning of the fifteenth century, when the so called *morality* plays all but superseded the scripture plays.

The fifteenth century though destitute of any creative genius like Chaucer or his contemporaries, was important in one particular viz., all the forces, that fashioned and moulded the glorious literature that followed this period, had their origin in this century. Herein was conserved, as it were, the energy, which made the glorious literature of the Elizabethan period. It was in this century that Europe saw the great Revival of classical learning—the Renaissance as it is called. This was a movement for introducing the classical spirit of the ancient Greek and Latin languages into the modern thought and literature. It is proper to distinguish this Renaissance from an earlier similar movement, the Renaissance of the fourteenth century—a movement set a going by the influence of Dante, Petrarch, Boccaccio and Chaucer. The seed of the Reformation, which bore fruit in Luther's time, was also

laid in the soil of this century. It gave rise to a number of readers and writers; and it is responsible for such work as Fox's *Acts and Monuments*.

The introduction of Printing in 1477 by William Caxton, who died in 1491, was in itself a social and literary revolution. The first book printed in England was Lord Rivers's *Dicts and Sayings of the Philosophers*, "emprynted by me William Caxton, at Westmestre." Caxton was himself a diligent translator and a stylist in English prose.

The spirit of adventure, ushered in by the voyages of Columbus and Vasco da gama during this period, also contributed in no small measure towards the enrichment of the literature of the Elizabethan Age.

AJAX.

REVIEWS

Historical Essays (in Bengali). By Professor Benoy Kumar Sarkar M.A. of the Bengal National College (Calcutta: Messrs. Chackerverty, Chatterjee and Co.) Re. 1-4.

Messrs Chackerverty Chatterjee and Co. have published a collection of essays in Bengali on historical subjects from the pen of Professor Benoy Kumar Sarkar M.A. of the National College, Calcutta. These *Historical Essays* open a new chapter in the history of Bengali Prose Literature. The author commands the power of expressing high and serious thoughts in clear, simple and yet powerful language. The chaste and dignified style as well as the masterly treatment of the subject matter give the handy volume a unique place in our literature and indicate the new spirit and tone that have begun to enliven the national life of our people.

There are altogether nine essays in the volume each marked by freshness and originality that instruct as well as suggest. The Professor's conception of History as the science of the *whole* of human affairs is sufficiently indicated in the preface where he also throws out suggestions as to how the facts and phenomena of Indian history through the ages should be interpreted and explained so that the idea of a living,

moving, growing and expanding people may always be before the mind's eye. His close and acute analysis of the Greek character and explanation of the contrast with the Hindu culture and civilisation, his study of the place of the Sikhs in Indian History and description of the forces that underlay the intellectual and social life of the Hellenistic world are all applications of the comparative-philosophical method that is the life of modern historical science. The paper on the *Science of History and the hope of mankind* is an application of truths of Biology to the Social world and explains the ups and downs of nations by referring to the laws of life. It contains an original interpretation of the facts of European history. The truth that the destiny of a nation is not the making of its own people solely but is moulded by the interaction of world forces is very ably brought out. All teachers of History should take note of this. The Essay on the *Teachings of History* is the product of a thoroughly Hindu mind, bringing out as it does, the Vedantic and transcendental conception that History is the record of the progress of the human soul, it is the positive register of the truths of morality and religion and that it is essentially a branch of *Dharma-Sastra*.

We wish the author had published some of these essays in English for the ideas throughout are intensely original and in many points different from the accepted views of western scholars. We, however, welcome the collection as a contribution to Bengali philosophical literature which unfortunately, as yet has been very slender. As Principal Ramendra Sundar Trivedi laments in the Preface he has contributed for the volume before us, there has been no body to continue the work of the late Babu Bhudeb Chandra Mookerji the eminent literateur and scholar, and hopes that Prof. Sarkar has in this little work given an earnest that will fitly give him place as the successor of the great man. Yes, Professor Sarkar is continuing the work of Bhudeb Chander not only as a historical Scholar and man of letters but also as an educational missionary.

Who's Who 1912 (10s net), *Who's Who Year-Book 1912-13* (1s net), *The Writers' and Artists' Year-Book 1912* (1s net), *The English-Woman's Year-Book 1912* (1s6d net) (London : A. and C. Black).

We are glad to acknowledge with thanks receipt of Messrs. A. and C. Black's invaluable Year-Books. The *Who's Who* is an indispensable hand book of reference and it worthily maintains its high reputation, it is an absolute necessity to every professional and business man and is none the less interesting to all as it is *the* annual biographical directory. The *Who's Who Year-Book* is a small companion to the *Who's Who* and consists of the tables forming the original nucleus of "*Who's Who*" itself, these tables supply exactly the kind of information which is needed to enable any one to take full advantage of the information in '*Who's Who*'. The '*English woman's Year-Book and Directory*' contains a marvellous amount of valuable information relative to women's professions trades, employments, sports, pastimes, philanthropies. It gives valuable information on every conceivable branch of work in which women can take part. "*The Writer's and Artists' Year-Book*" is an indispensable companion to Editors and authors alike, it gives in compact form some 600 addresses to which Mss. may be sent and the kind of "copy" preferred.

King George's Speeches in India. Re. 1. Messrs. G. A. Natesan and Co., Publishers, Madras, have brought out a complete and up-to-date collection of all the speeches delivered by His Majesty the King-Emperor during his first tour in India, as Prince of Wales and his second tour in connection with the Coronation Durbar. No speech of any importance relating to India has been omitted; and to make this handy collection of His Majesty's Indian Speeches doubly valuable, a useful Appendix has been added, containing among others, the text of the announcement relating to the Coronation Durbar Boons; the Proclamations of H. M. King George, Queen Victoria and King Edward the Seventh on their accession to the throne and the messages of Queen Victoria and King Edward to the Durbars of 1877 and of 1903. The book contains a fine portrait of Their Majesties as frontispiece and seven other illustrations. We hope that this handy volume will be welcomed by the millions of His Majesty's subjects not only in India but all over the British Empire.

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BUSINESS NOTICES.

All communications intended for the Editor should be addressed "To the Editor" and not to any member of staff by name.

All communications of a business nature (advertisements, changes of address, enrolment as a subscriber) should be addressed to the Manager, and all remittances should be made payable to him.

NOTICE TO CORRESPONDENTS.

Correspondents are requested to write legibly on one the paper while sending in MSS. for the press.

Communications intended for publication must be accompanied by the name and address of the writer not necessarily for publication but only to satisfy the Editor.

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Special Contract rates for 1 year, 6 months or 3 months can be had on application to the Manager, "The Collegian", 33 Dixon Lane, Calcutta.



Vol. 1 **THE COLLEGIAN** No. 12
An All-India Journal of Education.

CALCUTTA, SATURDAY 30TH MARCH, 1912

Wednesday morning the 20th instant, His Excellency Lord Hardinge accompanied by Sir William Duke, Sir Harcourt Butler and Mr. Kuchler paid a visit to the Lady Jane Dundas Hostel.

Hostel and two other hostels connected with the Scottish Churches College as well as the Eden Hindu Hostel. At the first-named hostel, the Viceroy, according to the report, carefully inspected the dining, bed and common rooms. His Excellency, we are told, mixed freely among the students and made many enquiries and was most affable to one and all.

This is certainly a proof of the interest taken by his Excellency in the welfare of the Calcutta Students' community. Lord Hardinge ever since his arrival in India is deeply concerned himself in the welfare of the rising generation of the country—an altogether new departure. We heartily congratulate His Excellency upon this happy inspiration.

We are glad to note that the widow of the late Sir P. N. Krishna Murti, Dewan of Mysore has undertaken to devote the grant of Rs. 35,000 (given her in consideration of her late husband's refusal to draw his pension for over five years) to the furtherance of Sanskrit education in Mysore.

On Thursday afternoon the 21st instant at Peshawar, in the presence of the Chief Commissioner and a influential gathering the foundation stone of the mosque for the proposed Frontier Province Islamia College was laid. A large number of Mahomedans and Mullahs attended the ceremony.

Sir Harcourt Butler in reply to Mr.

Allotment Imperial Grant Gokhale's question regarding the expenditure of the grant of 50 lakhs of rupees to popular education said :

"The Imperial grant of 50 lakhs a year for popular education announced at Delhi will be disposed of as follows :—

(i) 45 lakhs will be at once distributed to the major provinces :—

	<i>Rs. lakhs.</i>
(a) The extension and improvement of elementary education for boys, including the extension of free education	... 30
(b) Education (mainly elementary) of girls	... 5
(c) Hostels	... 5
(d) Technical and industrial education	2
(e) Education of Europeans and Anglo-Indians.	... 3

A public Lecture was held on Saturday, the 23rd Instant at 6-30 p.m. when **The Moslem Institute Calcutta** Dr. Aditya Nath Mukherjee, M.A. Ph D., of the Presidency College delivered a Lecture on "The idea of God." Professor H. Stephen, M.A., of the Scottish Churches College presided on the occasion.

School for Blind Children Anniversary The fourteenth anniversary of the Industrial Home and School for blind children was celebrated on Friday evening the 22nd inst. at the Town Hall under the presidency of Sir Lawrence Jenkins. There was a large and representative gathering. After a song in chorus by blind boys, Sir Lawrence Jenkins, in opening the proceedings, observed that Calcutta was the city of many good causes, and surely the education of blind boys was one of them. Sir Lawrence Jenkins paid a tribute to Mr. L. B. Saha's disinterested and indefatigable activity in this undertaking. He appealed for all possible assistance to brighten the lives of these poor boys. Mr. Justice Holmwood explained the aims and objects of the institution. He referred to the need for a commodious house where all the inmates of the Home could be well accommodated, and joined the President in his appeal for help. Mr. S. P. Sinha, who also spoke on the necessity of education for the blind boys, gave a contribution of Rs. 1,000 towards the funds of the Institution and promised a donation of another Rs. 5,000 for the building under contemplation. The following contributions were promised,—Mr.

R. D. Mehta Rs. 100, Mr. S. N. Roy Rs. 25, Sir R. N. Mukherjee Rs. 250, Maharaja of Nasipur Rs. 100, Dr. R. B. Ghose Rs. 120 Sir G. D. Banerjee Rs. 25, Mr. Justice D. Chatterjee Rs. 50, Sir Lawrence Jenkins Rs. 150, Mr. Justice Holmwood Rs. 100, the Hon. Babu Bhupendranath Basu Rs. 50, Mr. L. M. Das Rs. 100, Mr. McKartes Rs. 50, one of the audience Re. 1. Sir Lawrence Jenkins referred appreciatively to the last mentioned contribution and remarked that if the hundreds and thousands of the people of Calcutta would come forward each with that small contribution, the cause of the blind would be much advanced. A vote of thanks to the chair was passed on the motion of Sir R. N. Mukherjee.

The seventh annual meeting of the Anath Bhandar was held on Saturday evening, the 23rd inst. under the presidency of His Honor the Lieutenant-Governor of Bengal, at the Union Chapel in Dhurrumtolla Street, before a large and brilliant gathering. After the election of the office bearers and an appeal by the Secretary for funds in aid of a home for the Society, His Honor made a short speech, in the course of which he said that the reason why the Government had helped the cause of the institution was that it is an organised charity. His Honor considered a building for the Society as a necessity, because the institution required an office and a location of its own. He was not in a position to make any promise. But if the Society went on in the way it was doing it would have help from the Government. After a vote of thanks to the L-G moved by the Hon. Babu Debaprasad Sarbadhikari, the meeting separated.

SITUATION VACANT WANTED immediately for the Sri Partap College, Srinagar, Kashmir, a Professor of English and a Professor of Mathematics, with high qualifications and competent to teach up to B. A. classes. Salary Rs. 200-25-250.

Applications stating age, with attested copies of testimonials (which will not be returned) should be submitted to the Minister of Education Jammu and Kashmir State, Jammu, not later than 15th March 1912.

Selected candidates only will receive reply.
By order
R. P. Pande, Secretary
to Minister of Education Jammu and Kashmir State.



MADRAS UNIVERSITY

University Lectures.

The Syndicate submits to the Senate for sanction, under Regulation 394, the following list of lectures proposed for the academic year 1912-3:—

Name of Lecturer.		of Course, delivery.		
Mr. Dodwell, M.A.	Indian Economics	
Mr. H. J. Allen, M.A.	The Federal State among the Anglo-Saxon Race.	2nd	20-25 lectures.	3rd term
Mr. Mark Hunter, M.A.	The History of English sounds from the end of the Middle English period to the present day.	do.	20 lectures	2nd term
Rev. J. M. Craig, M.A., B.D.	Historical English Syntax.	do.	do.	3rd term
Mr. J. H. Mackintosh, B.A.	The Elizabethan drama with special reference to set plays.	do.	do.	1st term
Mr. P. F. Eyson, B.A.	The Geographical distribution of plants with special reference to India'	do.	12 lectures, 12 demonstrations	2nd term
Mr. K. Ramunni Menon, B.A.	Introduction to Animal Embryology	1st and 2nd	30 lectures, 20 hours (Practical.)	2nd term

Supplemental list of awards for 1911 made
by the Syndicate:—

The Krupabhai Satvanathan Memorial Medal.	Evangeliline Lazarus ...	Public Examination for Second-ary School Leaving Certificate—English.	Sarah Tucker College, Palamcottah.
The Kerala Varma Medal.	Appa Navar, Kunatkat Chandu Nambiyar, Kan- not I	{ B.A.—Malay-alam	Madras Christian College, St. Joseph's College, Trichinopoly, and Madras Christian College.
The Hajee Budan Prize ...	Abdul Qadir Khan, Kun- gal.	{ B.A.—Urdu...	Central College, Banga-lore.
The Hobart Prize ...	Mir Alam Ali Khan Ravi Varma Koil Tampu- ran, L.A.	{ M.B. & C.M. ...	Nizam College, Hydera- bad. Medical College, Madras.
The Sir Gabriel Stokes Prize.	Tirumalaiswami Aiyar, K.	B.E., Civil ...	College of Engineering, Madras.
The Sir V. Bhashyam Aiyangar Gold Medal.	Alipi, Chowkaran O. ... Raghavachari, V. ...	{ B.L. ... Law, etc.	Law College, Madras. Do.

The Syndicate recommends—

That the Senate accept from M. R. Ry. D. M. Narasinga Rau Avergal, B. A., B. L., an endowment of Rs. 1,700 to be invested in 3½ per cent Government securities, for the purpose of providing a Gold Medal to commemorate the name of the late Sir P. N. Krishnamurti of Mysore, under the following conditions:—

(1) The medal shall be called 'The Sir P. N. Krishnamurti Gold Medal'. (2) On its obverse, it shall bear this name ; and on its reverse, the words 'The University of Madras' together with

the name of the candidate, the year of presentation and the subject for which it is awarded. (3) It shall be awarded annually in open convocation to the candidate who, in passing the Bachelor of Arts (Honours) Degree Examination in Branch vi with Kanarese as his second language, obtains the highest number of marks in that language and is placed in the first class of the successful candidates in that Branch. (4) If in any year there be no such candidate the medal shall be awarded to the candidate who, taking Kanarese as his second language in Group (vi) of the B. A. Degree Examination, obtains the highest marks in that language, is placed in the first class of the successful candidates in that group and qualifies for degree in the same year. (5) If in any year there be no candidate eligible under conditions (3) or (4), then the medal shall be awarded to the Native of Mysore that passes highest in the first class the B.L. Degree Examination. (6) In the event of there being no award in any year, the unexpended interest shall be added to the corpus of the fund. (7) Consistently with the object of this endowment, the Senate shall have the power to make such changes in the conditions of award as new circumstances may render desirable.

Maharaja of
Travancore
Cuzzon
Prize

The prize for 1913 shall be for a thesis in Experimental Physics. Candidates are at liberty to select for their theses any subject in Experimental Physics which they may prefer.

All theses should reach the Registrar on or before the 1st February 1913.



and Schools.

Sir Harcourt Butler presided at the third general meeting of the David Hare Training College which was held on Friday afternoon the 22nd inst., before a fair gathering including the Hon'ble Mr. Kuchler, Principal James, Prof. J. N. Das Gupta, Mahamahopadhyaya

David Hare
Training
College
Calcutta

Dr. Satish Chandra Vidyabhusan, Prof. B. N. Sen, Dr. U. N. Brahmachari, the Hon'ble Mr. D. P. Sarvadhikari and Mr. P. N. Mukherji.

Two songs by Captain O'Brien and one Bengali song by Babu A. C. Mitra formed the programme of entertainment. Tea and light refreshments gave the function its finishing touch.

After the annual report was read the President made his speech.

The Hindu College, Delhi has complied with the condition of the Punjab University Syndicate that the balance of the price of its building should be paid before the University grant of five thousand was made. The College has now no liabilities. The grant will help the creation of a science laboratory which is required to meet the University's threat of disaffiliation.

Hindu College
Delhi

St. Andrews
College
Gorakhpore

St. Andrew's College, Gorakhpore, is to be raised to the status of a first grade College and B. A. classes in Arts will be opened in July next.

Muir Central
College
Allahabad

Mr. Homersham Cox, Professor of Mathematics, Muir Central College is retiring from service.



Discussing the subject of education at the U. P. Council Meeting of the 13th, Mr. C. F. Dela Fosse Director of public Instruction referring to the proposed Institute at Cawnpore said:—

"As regards the Technological Institute, Cawnpore, the Secretary of State has recently sanctioned a commencement being made on what is after all a generous scale, though not quite a lavish one as some had hoped. The nonrecurring cost will be Rs 3, 40,000 and the recurring Rs. 42,757. These amounts will provide for the erection of a laboratory and workshop, houses for the staff

Cawnpore
Technological
Institute

and a library, as well as for the entertainment of a Professor of applied Chemistry in some branch still to be determined, four assistant professors and a full subordinate staff. The library will be an institution of much importance, for it will provide also for the needs of the neighbouring Agricultural College and will be open to genuine seekers after technical information among the public. That there will be no avoidable delay in realising the scheme the council may rest assured, for Government has ordered that it shall be proceeded with as an urgent matter".

1. Abul Hasan Zaidi. 2. Bhagwat Das Choubay (H in Biology 1st prize.)
 Cawnpore 3. Bishna Dass Seth (H in Chem-
 Agricultural istry.) 4. Budhi Lal. 5. Chandra
 College 6. Gouri Charan. 7. Gur
 Licentiate in Shakhher 8. H and 1st prize in Agri.
 Exam. 1st prize in aggregate) 8. Hamid
 results. Husain Khan (H in Chemistry. 1st
 prize) 9. Hari Chandar Mitra. 10. Harsaran
 Sahai 11. Jai Prakash. 12. Kishun Behari
 Lal. 13. Mirchi Lal. 14. Nand Kishore. 15.
 Nounit Lal 16. Puttan Lal. 17. Raghunath
 Pd. 18. Ramcharan Lal. 19. Rashid Ahmad.
 20. Rup Kishore. 21. Salik Ram. 22.
 Saroop Narain. 23. Shiva Dularae. 24.
 Shiva Golam. 25. Shyama Charan Missra.
 26. Sital Pd.



A CANDIDATE for the External D.Sc. degree in Chemistry submitted last year a thesis which was not accepted. Sir
 London W. Ramsay thought the decision
 University was wrong, and forwarded the thesis to three of the greatest authorities on the special subject at Leipzig,

Geneva and Harvard, who replied that the work would have secured a doctorate at French, Swiss German, and American Universities. Armed with these opinions the Professor approached the London Senate, urging a reconsideration of the case. The Senate consulted the examiners and declined to take any action. A second appeal was met by a refusal of the Senate to reopen the question.

As the result of the Scottish Exhibition at Glasgow last summer, the sum of £15,000 necessary for the endowment of a
 Glasgow Chair of Scottish History at
 University Glasgow University has been obtained, and there is a further surplus of profits which will probably amount to about £5,000. The Lord Rector, Mr. Birrell, visited Glasgow University on February 9, and was the guest of the Union at a house dinner. In an amusing speech he recalled a visit which he paid to the University at the age of ten, in the company of his father, who had studied there. The University Court had another long discussion on the question of inclusive fees and approved by a majority a reply to the proposals of the General Council that inclusive fees should be optional. As a concession to the view of the Council it was resolved "that any student, not being a beneficiary of the Carnegie Trust, who, on presenting himself for graduation, can show that the classes which he has actually taken would, if paid for severally on the scale of fees in force at the time, have amounted to a less sum than he has paid in inclusive fees shall be entitled to have the balance repaid to him by the University." The students whom the Council desires to safeguard would thus pay for their curriculum exactly the same amount as the Council desires that they should pay (i.e. two guineas less than the inclusive fee); but instead of paying for single classes they would pay the inclusive fee and have the two guineas returned at the end of their course. In spite of this, three of the representatives of the General Council voted for an amendment in favour of the Council's proposal. The Council's original proposal was absurd enough, and it is difficult to find an adjective to describe this action of some of their representatives.

The Glasgow Technical College has received an intimation from the Secretary for Scotland that the King has conferred on the

College, the title of the Royal Technical College, Glasgow. The College is the largest of its kind in the Kingdom. It attracts students from all parts of the world, and its new buildings, which have been erected during the last ten years at a cost of £370,000, contain more than seven acres of floor space and are believed to be the largest of their kind in existence.

The Board of Education has been in communication with the Vice-Chancellor and the Council with regard to the Cambridge study of Solar Physics and the building of an Observatory for that purpose. Cambridge is to receive a capital grant-in-aid of £5,500 and an annual one of £3,000. The Board of Agriculture and Fisheries is prepared to recommend a grant of £18,000 to cover the capital, &c., required for a farm and the accommodation necessary for two Research institutes in Plant Breeding and Animal Nutrition, and an annual grant which is provisionally set down at something between £4,000 and £5,000 to maintain the two studies in working. These grants and proposals are the more welcome in that some years ago the Government (not this one, if we remember, but the previous one) swept away Forestry to Oxford, with the result that students of Forestry preparing for India had to leave Cambridge for the sister University. The other benefaction is one made by Dr. Jamieson B. Hurry, of St. John's College, to commemorate Sir Michael Foster. It is to be the Michael Foster Studentship in Physiology, awarded in every other year and of the value of £1,000. The student is to carry on research in Cambridge, unless he has special leave of absence.

THE WORLD OF UNIVERSITIES.

APPOINTMENTS OFFICE (Harvard University (U. S. A)) :—

The Appointments Office procures suitable positions for undergraduates, graduates, and all past members of the University seeking

employment of any sort, whether temporary or permanent; and, conversely, recommends for vacant positions made known to the Secretary the best available Harvard candidates. This service is not limited in its application to the students of any one Department of the University or to any one class of occupations. In making recommendations for vacant positions the Secretary has the help of all Departments of the University—in fact all recommendations for strictly teaching positions are made only on the approval of the Departments of the University to which the position to be filled is related; and in every case the Secretary seeks only the best available men, keeping in mind men already successfully employed as well as those who may be out of employment.

All past or present members of Harvard University seeking employment are invited to communicate with the Secretary. They are also urged to inform the Secretary of the result of their candidacy for any position and of their desires regarding future promotion or changes of employment. All persons who secure the services of Harvard men through the agency of the Appointments Office are invited to inform the Secretary of the quality of the services rendered.

In the Appointments Office may be found comprehensive records of all the men registered in the Office. The Office undertakes not only to answer inquiries directed to the Secretary but also to secure for the inquirer the opinion of any officer or teacher of the University, about candidates for positions.

Besides permanent employment opportunities frequently present themselves by which students who need to increase their income may obtain, in term-time or in vacation, employment of various kinds, such as typewriting, stenography, canvassing, office work, newspaper work, singing and private tutoring. Students who wish to be regarded as applicants for such employment should register their names, with a statement of their qualifications and of kind of works they desire, with the *Secretary for Appointments*. No charge is made for the services of the Appointments Office.

ADHYARAJA (आद्यराज).

By R. Pischel.

*Translated from the German * by**Vanamali Chakravarti, M. A., Vedantalirih &c.
Gauhati.*

Bana (बाण) in his famous introduction to the Harsacharita (हर्षचरित), which is so important for the history of Sanskrit Literature, has placed the two following Slokas at the end of the enumeration of the poets :—

आद्यराजस्ततोत्साहे हृदयस्थैः स्मृतेरपि ।

जिह्वाऽन्तः कृपसाद्येव न कविले प्रवर्त्तते ॥ १८ ॥

तथापि शृपंभक्त्या भीतो निर्बुद्धाकुलः ।

करीम्याख्यायिकाभीर्षी जिह्वाप्रवन चापलम् ॥ १९ ॥

All are agreed that Adhyaraja (आद्यराज) is a poet. The Commentator Sankara (शङ्कर) says :—

आद्यराजः कथित् कविः ।

Hall remarks (Vasavadatta, p. 15) “Adhyaraja (आद्यराज) appears to have been a poet of more capacity than performance”. Bohltingk explains Adhyaraja (आद्यराज) as the personal name of a poet; Peterson (Kadambari, Intro., p. 96) doubts the existence of the “poet Adhyaraja (आद्यराज) or Adyaraja (आद्यराज)”; Cowell and Thomas in their translation of Harsacharita (हर्षचरित) says (p. 3) “An unknown poet unless it refers to Gunadhya (गुणाध्या), the author of of Vrihatkatha (बृहत् कथा). utsaha (उत्साह) seems to refer to a pantomimic recitation as well as to general energy”. Who Adhyaraja (आद्यराज) was becomes, however, immediately clear, if we do not separate the sloka 18 from 19, but connect them closely together, as is required by तथापि. I translate: “By the heroic deeds performed by Adhyaraja (आद्यराज), although I remember them and they remain in my heart, my tongue is, as it were, drawn inwards and goes not to Poetry. In spite of it, however, I let my tongue frivolously swim in the ocean of narratives, through love for the monarch, full of timidity †

and doubtful of the issue”. From this it is quite clear that Adhyaraja (आद्यराज) is no other than Harsa (हर्ष), the patron of Bana (बाण), and that the slokas refer to Harsacharita (हर्षचरित). utsaha (उत्साह) refers to the energy of Harsa (हर्ष), and denotes one of the three elements, which make the kingly power [प्रभुशक्ति, मन्त्रशक्ति, and उत्साहशक्ति] Bana says that Harsa's deeds are so mighty that his tongue, as it were, draw itself inwards, and dare not sing them in verse; but that he would still attempt the difficult task.

Adhyaraja (आद्यराज) is also mentioned in Sarasvatikanthabharana (सरस्वतीकण्ठाभरण), p. 57, 8 ed. Barooah = p. 156, 7 ed Benares :—

केऽभूषन्नाद्यराजस्य राज्ये प्राक्तनभाषिणः ।

कानि श्रो साहसादस्य केन संकृतवादिनः ॥

So reads the edition of Dravida Viresvara Sastri, Benares, Simvat 1943. This sets aside the enigmatical reading natyaraja (नाट्यराज) of the edition of Barooah. I had already doubted the correctness of this latter reading in my Grammatik der Prakritasprachen §30. Of the Mss. of the Sarasvatikanthabharana (सरस्वतीकण्ठाभरण), which I have since looked into, the Ms. no. 1133 of Eggeling, Catalogue of the Sanskrit Manuscripts in the Library of the India office III, p. 322, reads Apvarajasya (अप्वराजस्य) or Atva—(आट्वा—), the Telegu Ms. No. 1134 Adyarajasya (आद्यराजस्य). This reading is also found in the Oxford Ms. of Anfrecht, Catalogus No. 489, and Hall found it along with Adhyaraja (आद्यराज) in the Mss. of the Harsacharita (Vasavadatta, p. 54), Compare Peterson, Kadambari, Introduction, p. 68, 5. The Commentator of Sarasvatikanthabharana (सरस्वतीकण्ठाभरण), Ratnesvara (रत्नेश्वर) explains Adhyaraja by Salivahana (शालिवाहन) and Sahasanka (साहसका) by Vikramaditya (विक्रमादित्य). At all events, it follows from this passage that Adhyaraja (आद्यराज) was not a poet, but a King, and indeed as Harsacharita (हर्षचरित) shows, Harsa himself. But then we must resolve केऽभूषन्नाद्यराजस्य into केऽभूषन्नाद्यराजस्य i. e. न + आद्यराजस्य, corresponding to केन संकृतवादिनः of the second verse. The three dramas Ratnavali (रत्नावली), Priyadarsika (प्रियदर्शिका), and Nagananda (नागानन्द) which are ascribed to (हर्ष) fall in his time

* Gottinger Nachrichten, 1901, pp. 485-487.

† The correct reading is bhito (भीती), not abhito (अभिती), as the edition has it, following the Commentators. Peterson rightly reads bhito (भीती), (Kadambari, Introduction, p. 68).

and they are rich in Prakrita. It would be added that the sloka is not to be understood as meaning that to the time of Adhyaraja (आद्यराज) only Prakrit and to that of Sahasanka (साहसाङ्क) only Sanskrit might have been spoken. The sense is rather that to the time of Adhyaraja (आद्यराज) every body could speak also Prakrit and to the time of Sahasanka (साहसाङ्क) also Sanskrit.

Sahasanka (साहसाङ्क), as already remarked, is explained to mean Vikramaditya (by Ratnesvara). With this, agrees the Prabandhacintamani (प्रबन्धचिन्तामणि), where Vikramaditya (विक्रमादित्य) is twice named Sahasanka (16, 12; 47, 16). Bhandarkar is right that by Vikramaditya (विक्रमादित्य) at whose court the "nine Jewels" are placed, is to be understood Candragupta II (चन्द्रगुप्त)—(Journal of the Bombay Branch of the Royal Asiatic Society 1900, p. 397 &c.) That this King had the surname Sahasanka (साहसाङ्क), is indeed very probable, for he certainly was often called Vikramanka (विक्रमाङ्क) (Corpus Inscript. Ind. 3, Introd. p. 18). Thus the verse in Sarasvatikanthabharana (सरस्वतीकण्ठाभरण) can refer to him and to the beginning of the fifth Century. Salavahanadeva Sahasanka (शालवहनादेव साहसाङ्क) is excluded by consideration of the time. This is indeed the Sahasanka (साहसाङ्क), under whom Haricandra (हरिचन्द्र) the predecessor of Mahesvara (महेश्वर), wrote his commentary on the Carakasamhita (चरकसंहिता), and whom Mahesvara (महेश्वर) himself celebrated in his Sahasankacarita (साहसाङ्कचरित)—Anfrecht, Catalog. Oxon. p. 187b. He could hardly be the here of Navasahasankacarita (नव साहसाङ्कचरित) of Sriharsa (श्रीहर्ष), as Purnaiya thinks (Indian Antiquary 3, 29ff.). The hypothesis that Sahasanka (साहसाङ्क) in the Sarasvati Kanthavarana (सरस्वतीकण्ठाभरण) is merely a shorter expression for Navasahasanka (नवसाहसाङ्क) and that thereby is meant Sindhuraja (सिन्धुराज) the father and predecessor of Bhoja (भोज), who has been celebrated by Padmagupta (पद्मगुप्त) in the Navasahasankacarita (नवसाहसाङ्कचरित), is also entirely groundless. For in that case the verse would refer to the immediate past, as the Sarasvatikanthabharana falls in the time of Bhoja. On the Contrary, if we refer it to Candragupta II Vikramaditya, the verse would refer to two great patrons of Literature one

belonging to the 7th and another to the 5th century which, moreover, is a time, sufficiently remote from the Sarasvatikanthabharana (सरस्वतीकण्ठाभरण).

That neither Adhyaraja (आद्यराज) as a surname of Harsa (हर्ष), nor Sahasanka (साहसाङ्क) as a surname of Chandragupta II, (चन्द्रगुप्त २) is found in the inscriptions, is no evidence against the correctness of our hypothesis. It has long since been proved that the historical statements in the Literature have a much greater worth than was formerly believed, and that they often supplement and complete the information supplied by the inscriptions, as they themselves are often confirmed by the latter. In this connection, one has only to remember Buhler's discussions about Hemacandra (हेमचन्द्र), Padmagupta (पद्मगुप्त), Arisimha (अरिसिम्ह) as well as his introduction to the edition of Bilhana's (बिल्हण) Vikramanka devacarita (विक्रमाङ्कदेवचरित). That Sahasanka (साहसाङ्क) was a surname of a famous personage follows also from this, that later Kings often adopted the honorary title of Navasahasanka (नव साहसाङ्क).

Vanamali Chakravarti

Gauhati

5-3-12.

The Inductive Method of Teaching—IV.

VII. Natural Sciences.

We have seen that on the inductive method of teaching the student is placed before the thousand and one facts and phenomena of the mental and physical worlds when he studies literary and scientific subjects. Even so in order to learn the industrial arts the student has to familiarise himself with the processes of manufacturing the various object of human use. So also he needs must observe the various processes of manufacture adopted in producing useful commodities. As the natural sciences are learned by observation and experiment and the mental sciences are mastered by regard being had to the psychological characteristics of human mind and to the various constituent elements of human society, so also the student has to acquire knowledge in the industrial arts by

resorting to a practical course of study at the workshops and manufactures. In subjects like these it is useless to depend upon books and to learn formulas by rote. The workshop is to be regarded as both the instructor and the training ground.

The prevalent method of imparting knowledge in these subjects is to require the students to commit to memory the formulas in the first instance, and then certain experiments are shown to them by way of supplement as illustrative of the formulas. This is far from what it ought to be. According to the method of teaching, on which we have been expatiating so long, books are of secondary importance; in it the workshops and laboratories occupy the foremost position. Here the truths arrived at by laboratory experiments are to be endorsed by books if necessary. The theoretical book-knowledge is not to be verified by experiments, in the laboratories and workshops. The teachings of the factories are to occupy the place of and even to subordinate the use of books.

VIII.—General Remarks on Inductive Method.

A great variety of materials and incidents, thoughts and ideals, actions and deliberations, changes and transformations, processes and appliances has to be placed before the student when the teacher adopts the inductive method of teaching. The student has to examine each object from various stand-points, and various aspects of each subject have to be studied. When a sufficient number of facts has been accumulated, and each subject examined and analysed, materials will be ready for the formulation of theories and hypotheses regarding their common nature and characteristics and the laws of their working. When these hypotheses and guess-works about the casual relations and order of occurrences have been well tested and brought into relation with one another, the path will be opened up for the discovery of the unity in the diversity, and the 'scientific' truth about the subject. In the end there will be a body of truths systematised and organised, in other words, a science.

In the foregoing pages we have only made some general remarks on the inductive method. We have not said how this method will have to be modified with the advancement of each of the subjects that falls within

the range of study. We have also omitted to mention the defects and imperfections of this system. It is in contemplation to bring out a work which will deal with these points elaborately.

FOREWARD TO THE BOOK.

The plan of this book will be as follows:

Vol. I divides itself into a number of parts according to the educational ideals among the different nations of the world, such as the Greeks, the Hindus and the Egyptians.

Vol. II. will be subdivided into two parts. The first will treat of the theory of education and the general principles regarding its nature aims, and means; the second will be devoted to sketching out the best system of education that is adapted to the Indians of the modern age.

Vol. III is the practical portion of the whole work. This resolves itself into as many parts as there are subjects for study, e.g. Literature, Language, Chemistry, Mathematics, Zoology, etc.

Enormous labour and patience and a good deal of time are necessary to complete a work like this. Want of time owing to multiplicity of duties and inadequate knowledge in many branches. Besides, the comprehensive method set forth in these pages is being put into practice; for methods of teaching cannot be established if we have no opportunity of testing them, and its defects cannot be detected unless the application is watched instructing students of various ages and capacities. For these reasons a number of teachers is being trained up who will adopt this method of teaching in their tutorial work.

PLEA FOR THE WORK.

In conclusion I take the opportunity of frankly confessing that it may have been a sort of presumption on my part to attempt such a work as requires encyclopædic knowledge and a varied experience. But it is not the glory of having accomplished an almost impossible task that has actuated me to undertake it. Incompetent as I am, I make an attempt, however humble to supply one of the crying wants of our country. I sincerely hope that men of real ability will apply their energy in this direction and save the dignity of the undertaking.

I find unmistakable indications in our society and can understand from the signs of

times that in no distant future the question will assume momentous importance and engross the attention of our scholars and public men. Our workers and thinkers and educated men in general will take upon themselves the responsibility of the educational movement and will be pillars of various educational institutions. Mass education and female education, technical and commercial education, methods of teaching and education in research work, the training of teachers, and other problems connected with the great question of national education will occupy the foremost place in the people's thought. The highest form of patriotism and philanthropy will be displayed by him who devotes his life to the diffusion of learning and spread of education. And these control and govern all other movements in the country. The educational enthusiasm of the nation will grow wider and deeper and ultimately swallow up all other propagandisms. Workers and organisers will consider their sole religion to be the foundation of temples of learning that help forward the development of manhood and appreciate their highest self-realisation in applying themselves whole heartedly and devoting their whole time and energy to this work. Men will sincerely and earnestly flock to the field of education. The diffusion of culture is soon going to be an all-absorbing aim, the life's mission of some of our best men and a new form of Sanyasa and penance in our social system. The educator will be the Sanyasi and missionary of the future.

B. K. SARKAR.



TUDOR LITERATURE.

1500—1579.

The English literature of this period is not separated from that of the last century (1400-1500) by a sharp line of demarcation. The previous period was a huge preparation for the marvellous age of Elizabeth. During the period under review, one sees those machinery at work, the product to be enjoyed by the age to come. The two centuries

or more which stand between Chaucer and Shakespeare, are more or less of a passive rather than of an active nature. The whole of this period is rather imitative and critical than creative and original. I have dealt with the literature of the last century in a previous article, and here my purpose is to go upon a survey of the state of English literature in the 16th century, as far as the middle of Elizabeth's reign.

"By the year 1500 all the influences that moulded and fashioned the magnificent epoch with which the century closed, were playing upon our (English) literature, although some of them are faint and almost indistinguishable. Printing is in its vigorous youth; the Renaissance is beating upon our (English) shores and threatening for a time to overwhelm us (English) with a flood of indiscriminate classicism; Englishmen have already been travelling to Italy for the sake of the new learning, and will soon bring home thence the influence of a modern literature that is to compete with that of the ancient classics themselves. Translations from the classics have already begun to be made; together with translations from modern languages they will increase in number with passing years of the century. The Bible will soon require to be translated anew, and the right men will be found to do it. The Reformation is imminent. Momentous social and political changes have been taking place with the growth of the power of the people, especially of the middle and merchant classes. A stirring spirit of adventure, discovery, and invention is abroad; the names of Columbus, Cabot, and Vasco de Gama are all associated with the last decade of the fifteenth Century."*

From the same source, whence I take the above paragraph, I also quote, a very rapid survey of the period between 1500 1579. "In language," say Messrs. Wyatt and Low, "Hawes, is more modern than Chaucer; in subject, spirit, and treatment Chaucer is more modern than Hawes. In these latter regards it may plausibly be maintained that the first half of the sixteenth century links medieval to modern English literature, for we enter it with Hawes and we quit it with Surrey, spending much of the time on our way with More. These three

* A. J. Wyatt and W. H. Low.

names are here mentioned as seeming to be typical of the bulk of the writings of this age : Hawes is taken as the poet who stands on the hithermost verge of the middle ages, and is scarcely affected by the striving for a wider and higher culture which characterizes his younger contemporaries ; More is the central figure of the New Learning before the Reformation and of the fierce controversial literature engendered by the politico-religious strife of Henry VIII's reign ; Wyatt and Surrey give us the poetic first-fruit of the Renaissance. . . . In these earlier years of Elizabeth's reign we are, as in the previous half-century, still in a time of training, a time of preparation rather than one of great performance ; but the careful preparatory exercises are now approaching more nearly the standard of fine composition, and the years of diligent training are making it possible for the next generation to enter upon an inheritance of literary culture which their fathers and grand fathers had soiled assiduously and painfully to amass."

The reign of the first Tudor King, Henry VII, was too much taken up with political commotion to leave room for literary movements. His successor, Henry VIII, however "was a prince of great learning—in the catholicity of his tastes a true son of the Renaissance. As a theologian and skilled controversialist he attacked Martin Luther in a Latin treatise, for which Clement VII rewarded him with the title of Defender of Faith. Under himself and his successors this complimentary title has suffered some vicissitude. But Henry added nothing to English literature beyond the example of a royal scholar. His chief fame in this direction lies in his patronage of learned men and in the intellectual brilliance of a Court which contained Surrey, Wyatt and Sir Thomas More."*

It may not be unprofitable here to go little backward and find out the connecting link between past and present. The literary stream of England was never more steady than it was in the fifteenth century. To the political commotion of the wars of the Roses is generally ascribed this dearth. But it is also acknowledged that merit of high order was wanting at that time. Of course, this fact cannot be explained ; we are to accept it just

as it is ; in the same way as the abnormal swell of literature of the Elizabethan age is not explainable by logical syllogism. It was so ; but we can't say why it was so ? Our inquisitiveness must rest there. Every science defines a limit beyond which it would not be the inquirer's while to travel, because he will have blank silence in the shape of a reply, and the science of literature is not something out of the common way. This sterility in the English literature however, was not opposed to certain circumstances, over which one may stand and think. These were—the invention of Printing, the Reformation, the Renaissance etc. These great potentialities were found working during the short period between 1500 and 1579.

In a short time, Caxton printed many books, mostly translations of existing scattered materials. These printed English books considerably acted on the minds of men, for they naturally liked to read printed English, and thus English considerably ousted Latin from the field. Caxton also published editions of the older poets like Chaucer, Gower and Lydgate as well as of the then classics ; and these helped in no small degree towards diffusion of education.

The controversial prose received a strong impetus by the Reformation. Preachers arose, speaking vehemently against the abuses in the church. Controversial literatures were spread broadcast, e.g., Skelton against Cardinal Wolsey ; Roy against the Church. The Bible was translated by more than one hand. The restless activity incident upon the Reformation movement, has been described by Messrs Wyatt and Low, in the following manner :—

"The Reformation comes into contact with English literature in the controversies that it aroused and in the translation of the Bible. Some of the older scholars and friends of letters, such as More and Fisher, were staunch adherents of the old order, but in the hands of others, and specially the younger ones, the New learning was a powerful weapon to use against Romanism. A vast quantity of vigorous prose and verse is connected more or less directly with the reform of abuses in the Church. Thus Skelton's fierce invective in his own peculiar metre is directed against Wolsey as the all-powerful court-cardinal, but in no way against the Church, of which the satirist is himself a priest ; while

* Thompson.

Roy, on the other hand—quondam Francis Friar, and co-worker with Tyndale in his English version of the Bible—attacks both Cardinal and Church with a vigour and scurrility fully equal to Skelton's, though without a tithe of the latter's ability. More, who succeeded Wolsey in the Chancellorship and the hatred of the reformers, is the ablest of the few scholarly writers in English who uphold the old Church against Tyndale and the reformers, whilst, on the other side, Hugh Latimer's oratory is as remarkable for its form as its matter; to him must be given the credit of having produced some of the most masculine prose that is to be found in our language before the latter half of Elizabeth's reign."

The Vulgar provincialism and scurrility with which these controversies—not unoften person against person in the guise of principle against principle—were carried on, would not commend themselves to fair and impartial minds. Gracefulness, and what Mathew Arnold has called, the 'urbane' spirit were things unknown in these literatures. Still the polish which the English language received by these constant rubbings could be ill-spared. So, their value was not in what they wrote, but in how they wrote.

The old order was yielding place to a new, but there was an unmitigated thirst for classical ideals. The ancient Greek and Latin were voraciously devoured for the hidden treasures they were believed to contain. Shelves of old books were ransacked; flocks went to the seats of ancient civilization and reverently received what the grand-father of civilization had to give them. Dry productions of schoolmen had no more charm for them than a piece of shrivelled sugar-cane has for the Indian teeth. They asked for the nectar which Greek philosophy and Greek poetry contained, and they toiled for it.

I next propose to enter into a little more detailed account of the three broad aspects of literature—poetry, prose, and drama—of this period.

(To be continued)

AJAX.



CALCULATION OF π .

Calculation of π , i.e. the ratio which the circumference of a circle bears to its diameter, has been in former times of great importance in mathematics. In ancient times, the ratio had to be determined by actual linear measurements, as was done by Archimedes and other mathematicians of the age. The greatest accuracy which they could attain was $\frac{355}{113}$. They always represented it as a vulgar fraction,—which however goes to prove that they believed it to be such a fraction and necessarily a commensurable quantity. After the discovery of inverse circular function series, it was believed to be incommensurable, but no proof could be offered. In 1761 Prof. Lambert proved that π is incommensurable, and very lately Prof. Lindemann proved that even π^2 is incommensurable.

There are various methods of approximating the value of π ; the easiest and most useful is that, done by the representation of the angle $\frac{\pi}{4}$ in terms of its tangent. We know, if θ , be any angle

lying between $n\pi + \frac{\pi}{4}$, and $n\pi - \frac{\pi}{4}$, $\theta = \tan \theta$

$$= \frac{\tan^3 \theta}{3} + \frac{\tan^5 \theta}{5} - \dots\dots\dots$$

for $1 + i \tan \theta = \sec \theta (\cos \theta + i \sin \theta) = \sec \theta \cdot e^{i\theta}$
or $\log \sec \theta + i\theta = \log (1 + i \tan \theta)$, for $\tan \theta > 1$
and now considering only the imaginary parts in the expansion, we will have $\theta = \tan \theta - \frac{\tan^3 \theta}{3}$

$$+ \frac{\tan^5 \theta}{5} \dots\dots\dots$$

Now this theorem may be utilised in finding the value of π . Putting $\theta = \frac{\pi}{4}$ we have

$$\frac{\pi}{4} = 1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \dots\dots\dots \text{ad. inf.}$$

$$\text{or } \pi = 4 \left(1 - \frac{1}{3} + \frac{1}{5} - \dots\dots\dots \text{ad. inf.} \right)$$

But this series is very slowly convergent so that to find the value of π to some places of decimals with the help of this series, a very large number of terms will have to be taken. For this reason, other series have been used for this purpose.

$$\text{We have } \tan(A+B) = \frac{\tan A + \tan B}{1 - \tan A \tan B},$$

now, if we put $\tan A = x$, or $A = \tan^{-1} x$ and $\tan B = y$, or $B = \tan^{-1} y$

$$\tan(\tan^{-1} x + \tan^{-1} y) = \frac{x+y}{1-xy}$$

$$\text{Putting } \tan^{-1} x + \tan^{-1} y = \frac{\pi}{4}$$

$$\tan \frac{\pi}{4} = 1 = \frac{x+y}{1-xy}$$

Now it forms an indeterminate equation, and for a solution, having for the values of x and y , fractions with unity as numerator, we have

$$x = \frac{1}{3} \text{ and } y = \frac{1}{3}$$

$$\text{or we have } \tan^{-1} \frac{1}{3} + \tan^{-1} \frac{1}{3} = \frac{\pi}{4}$$

This series is called Euler's series. The name of the series, however, proves that Euler, who made the greatest contributions to circular functions, did not pay any attention to find better series than this. For, to find series, easier to expand and more rapidly convergent is a question of mechanical work and not of intelligence. I have found more than twenty such series, and am going to show the clue to them. Some of these series, as a matter of consequence, have coincided with those given in books.

$$\text{Suppose } 3 \tan^{-1} \frac{1}{x} - \tan^{-1} y = \frac{\pi}{4}$$

$$\text{or } 3 \tan^{-1} \frac{1}{x} = \frac{\pi}{4} + \tan^{-1} y$$

$$\text{or } \tan \tan^{-1} \frac{x^3 - 1}{1 - 3x} = \tan \left(\frac{\pi}{4} + \tan^{-1} y \right) = \frac{1+y}{1-y}$$

$$\frac{3x^3 - 1}{x^3 - 3x} = \frac{1+y}{1-y}$$

$$\text{Putting } x = 3, \frac{1+y}{1-y} = \frac{26}{18} = \frac{13}{9}$$

$$\text{Again suppose } \tan^{-1} \frac{2}{11} = \tan^{-1} \frac{1}{5} + \tan^{-1} \frac{1}{p}$$

$$\text{or } \tan^{-1} \frac{1}{8} + \tan^{-1} \frac{1}{2}$$

Then we have

$$\frac{2}{11} = \frac{\frac{1}{5} + \frac{1}{p}}{1 - \frac{1}{5p}}, \text{ or } (11 - 10)p = -57$$

$$\text{i.e. } \frac{1}{p} = -$$

$$\text{Similarly } \frac{1}{q} = \frac{1}{68}$$

Putting different values for x , and changing the multipliers of $\tan^{-1} \frac{1}{x}$, $\tan^{-1} y$ &c., the following series have been found.

I.

$$\frac{\pi}{4} = \tan^{-1} 1$$

$$= \tan^{-1} \frac{1}{3} + \tan^{-1} \frac{1}{3}$$

$$= \tan^{-1} \frac{1}{3} + \tan^{-1} \frac{1}{3} + \tan^{-1} \frac{1}{7} + \tan^{-1} \frac{1}{8}$$

$$\text{or } = \tan^{-1} \frac{x}{y} - \tan^{-1} \frac{x-y}{x+y}, \text{ the general theorem}$$

from which they are found.

II.

$$\frac{\pi}{4} = 2 \tan^{-1} \frac{1}{2} - \tan^{-1} \frac{1}{7}$$

$$= 2 \tan^{-1} \frac{1}{3} + \tan^{-1} \frac{1}{7}$$

$$= 2 \tan^{-1} \frac{1}{4} + \tan^{-1} \frac{1}{3} + \tan^{-1} \frac{1}{11}$$

$$= 2 \tan^{-1} \frac{1}{5} + \tan^{-1} \frac{1}{7} + 2 \tan^{-1} \frac{1}{8}$$

III.

$$\frac{\pi}{4} = 3 \tan^{-1} \frac{1}{3} - \tan^{-1} \frac{1}{5} + \tan^{-1} \frac{1}{57}$$

$$= 3 \tan^{-1} \frac{1}{3} - \tan^{-1} \frac{1}{5} - \tan^{-1} \frac{1}{58}$$

$$= 3 \tan^{-1} \frac{1}{4} + \tan^{-1} \frac{1}{20} + \tan^{-1} \frac{1}{1085}$$

$$= 3 \tan^{-1} \frac{1}{5} + \tan^{-1} \frac{1}{7} - \tan^{-1} \frac{1}{657}$$

$$= 3 \tan^{-1} \frac{1}{6} + \tan^{-1} \frac{1}{3} - \tan^{-1} \frac{1}{26} - \tan^{-1} \frac{1}{2682}$$

$$= 3 \tan^{-1} \frac{1}{8} + \tan^{-1} \frac{1}{3} - \tan^{-1} \frac{1}{27} - \tan^{-1} \frac{1}{5657}$$

$$= 3 \tan^{-1} \frac{1}{7} + \tan^{-1} \frac{1}{3} + \tan^{-1} \frac{1}{26} - \tan^{-1} \frac{1}{2057}$$

IV.

$$\frac{\pi}{4} = 4 \tan^{-1} \frac{1}{3} - \tan^{-1} \frac{1}{2} - \tan^{-1} \frac{1}{26} + \tan^{-1} \frac{1}{2057}$$

$$= 4 \tan^{-1} \frac{1}{4} - \tan^{-1} \frac{1}{6} + \tan^{-1} \frac{1}{327}$$

$$= 4 \tan^{-1} \frac{1}{5} - \tan^{-1} \frac{1}{359}$$

$$= 4 \tan^{-1} \frac{1}{6} - 2 \tan^{-1} \frac{1}{70} + \tan^{-1} \frac{1}{411}$$

$$= 4 \tan^{-1} \frac{1}{8} - \tan^{-1} \frac{1}{70} + \tan^{-1} \frac{1}{59}$$

V.

$$\begin{aligned} \frac{\pi}{4} &= 5 \tan^{-1} \frac{1}{5} - \tan^{-1} \frac{1}{6} - \tan^{-1} \frac{1}{80} \\ &= 5 \tan^{-1} \frac{1}{5} - \tan^{-1} \frac{1}{4} + \tan^{-1} \frac{1}{20} - \tan^{-1} \frac{1}{100} - \\ &\quad \tan^{-1} \frac{1}{110000} \\ &= 5 \tan^{-1} \frac{1}{5} + 2 \tan^{-1} \frac{1}{20} - 2 \tan^{-1} \frac{1}{20000} \end{aligned}$$

Now gradually the indeterminate equation becomes very large and cumbrous and takes long time for its solutions. We can, however, find general theorems for all such series but these general theorems have no meaning or at least no importance; e.g.

$$\tan^{-1} \frac{x}{y} - \tan^{-1} \frac{x-y}{x+y} = \frac{\pi}{4}$$

now, if for the sake of rapid convergence and simplicity in calculation we choose $x=1$ and $y=10000$

$$\text{we get } \tan^{-1} \frac{1}{10000} + \tan^{-1} \frac{9999}{10000} = \frac{\pi}{4}$$

The former of these angles can be very easily represented by the expansion of its tangent but in representing the latter in the same way, we will meet with difficulty greater than that is met with in reaching even the final result by means of any of the series stated. For this reason x, y , &c. in $\tan^{-1} x, \tan^{-1} y$ &c. are chosen to be aliquot parts of unity.

In writing the series, it is not necessary that $\tan^{-1} x, \tan^{-1} y$ &c. should be within $\pi + \frac{\pi}{4}$ and $\pi - \frac{\pi}{4}$, e.g.

$$4 \tan^{-1}(-4) - \tan^{-1} \frac{1}{6} + \tan^{-1} \frac{1}{80} = \frac{\pi}{4}$$

But during calculation we may change $4 \tan^{-1}(-4)$ into $4 \tan^{-1} \frac{1}{4}$ (i.e. the reciprocal of -4 , with the opposite sign), and proceed as usual.

This use, in calculating the value of π , is not a speciality of arc tangents, but other inverse trigonometrical functions can be used for the same purpose, but with less facility; e.g.

$$\sin^{-1} \frac{1}{\sqrt{2}} = \frac{1}{\sqrt{2}} + \frac{1}{2} \cdot \frac{(\sqrt{2})^3}{3} + \frac{1}{8} \cdot \frac{(\sqrt{2})^5}{5} + \dots \text{ad}$$

$$\text{inf.} = \frac{\pi}{4}.$$

$$\text{or } \sin^{-1} 1 = \frac{\pi}{2} = 1 + \frac{1}{2} \cdot \frac{1}{3} + \frac{1}{8} \cdot \frac{1}{5} + \dots \text{ad inf.}$$

Many geometrical truths also can be utilised in the same way. The three angles of a triangle are together equal to π . So

$\tan^{-1} \tan A + \tan^{-1} \tan B + \tan^{-1} \tan C = \pi$, where A, B, C are the three angles of a triangle, and for the purpose of calculation, we add, when one of them is not less than $\frac{3\pi}{4}$.

A similar equation is given by

$$\begin{aligned} \pi &= \tan^{-1} \sqrt{\frac{c(a+b+c)}{ab}} + \tan^{-1} \sqrt{\frac{b(a+b+c)}{ac}} \\ &\quad + \tan^{-1} \sqrt{\frac{a(a+b+c)}{bc}} \end{aligned}$$

In conclusion, the value of π , has been ascertained to 50 places of decimals, and as the calculations have been very carefully revised, it is hoped, the value is correct so far. The result was arrived at in the following way:—

$$\begin{aligned} \pi &= \left\{ 16 \left(\frac{1}{5} + \frac{1}{5 \cdot 5^3} + \frac{1}{9 \cdot 5^5} + \dots \right) + 4 \left(\frac{1}{239^3 \cdot 3} + \right. \right. \\ &\quad \left. \frac{1}{7 \cdot 239^7} + \dots \right) - 16 \left(\frac{1}{3 \cdot 5^3} + \frac{1}{7 \cdot 5^7} + \dots \right) - \\ &\quad \left. 4 \left(\frac{1}{239} + \frac{1}{5 \cdot 239^5} + \dots \right) \right\} \\ &= 3 \cdot 1415926535897932384626433832 \\ &\quad 7950288419716939937509 \dots \end{aligned}$$

BANKIM CHANDRA BHATTACHARYYA

First year class, Presidency College

CALCUTTA.

REVIEWS

Peoples and Problems of India. By Sir T. W. Holderness, K. C. S. I. (Home University Library : Messrs Williams and Norgate). 1s net.

A valuable Addition to "the Inexhaustible Treasure-House". The book is useful alike to the teacher and student and is quite up to date.

In England. By S. G. Dunn M.A. (Oxon.) (London : Macmillan).

A handly little book describing a journey to England. It would be most useful to school students.

Direct French Course. By H. J. Chaytor M.A. (London : W. B. Clive) 1s 6d.

As the name indicates the author deals with the new method of teaching French. He begins from the sentence and then goes on to the grammar.

Outlines of Deductive and Inductive Logic—Book I General Introduction. By Professor Sibeswar Dyal M. A. of the Behar National College, Bankipore, Behar.

This is the first part of a book on Logic which the author intends to publish for the use of Intermediate Studends. It has been revised by Professor Henry Stephen. The production gives an accurate account of the introductory portion of Logic in a very clear and easy language. The exposition is lucid and we hope the book when complete will do a good service to Professors and students of Logic throughout India.

CORRESPONDENCE.

THE CUNNINGHAM MEMORIAL.

To.—The Editor, Collegian, Calcutta.

Sir,

In referring to the Late Mr. J. A. Cunningham His Excellency the Chancellor of the Calcutta University in his convocation address the other day said :—

"The early death of Mr. John Arthur Cunningham has deprived us of a brilliant and enthusiastic worker whose ideals and sympathy for Indian students early won him respect and affection in many quarters."

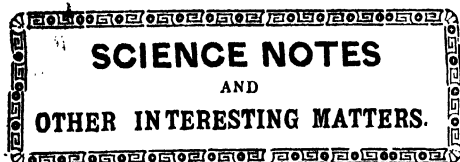
Mr. Cunningham's sudden and untimely death evoked considerable sympathy among those who valued and appreciated him as a man, a Scientist and an Educationist and a movement for a suitable memorial was started. There has been some response in this country as well as in England but enough has not yet been subscribed to initiate a worthy memorial. The late Mr. Cunningham was keenly interested in high education as he was in the advancement of the backward Chotanagpur people in whose midst the last of his life's work lay and it is felt that his memorial should take shapes beneficial to both. Much larger sums will therefore be needed than have been yet subscribed. Friends sympathising with the cause are therefore invited to send their subscriptions as early as convenient to the Bank of Bengal, Cunningham Memorial account which was opened some time ago or to the under-signed or to Professor Peake or Professor Mahalanavis, Presidency College. Subjoined is a list of the subscriptions promised.

Yours faithfully,
Deva Prosad Sarbadhikary.
2 Old Post Office Street.

Contributors to the Cunningham Memorial Fund.

First List.

	Rs.—A.—P.
Prof. A. Schuster	375 0 0
Hon'ble Justice Sir Ashutosh Mukherjee	100 0 0
Hon'ble Mr. G. W. Kuchler	250 0 0
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Sir J. J. Thomson complained of the neglect of reading and the too great dependence on oral tuition. This complaint was the outcome of his Cambridge experience. We wonder what he would say if he had to teach evening classes in our technical colleges, where the majority of students are literally unable to read—i.e. to read in the sense of studying a book or memoir. So long as classes of sixty or more exist, it is difficult to cure this state of affairs; but it is surely one of the most important duties of a school to give to its pupils the power as well as the will to acquire knowledge by reading. With smaller classes this task must no longer be neglected, or scientific and technical education cannot develop. We are glad to hear that "reading" will form an important subject for discussion at the next meeting of the British Association.

Mme Montessori, herself a physician of note, has pursued the inquiries of Seguin and others, and has developed a system of education, applicable to the early years of childhood, apparently so complete that it can be introduced into schools in its entirety. In June of last year, as we learn from a most interesting article in *The World's Work*, a law was passed in Switzerland establishing the Montessori system in all the schools of the country. The system appears to be based both by Mme Montessori and her predecessors, upon the study of abnormal children. But in practice it has been found suitable for those who are intelligent. The primary object is to put the child in an atmosphere in which there is no restraint and nothing to make him perverse or self-conscious, in order that his personality may be liberated and may have free play. The child is watched rather than taught, and his "good" movements encouraged; while the "evil" ones are carefully repressed.

In a paper read before the Royal Society on February 8, Drs. Harker and Kaye described a new method of obtaining electric currents. Steady currents were obtained for an hour between two carbon rods—one at the temperature of about 2500° C., the other being kept at a moderate temperature by water-cooling. The currents are such as would be produced by the emission of negative particles from the hot carbon, and it was found that the atmosphere of the furnace was highly ionized at ordinary atmospheric pressure. The furnace need not be an electric one.

A new
Electric
Generator

